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Precision Range Integrated Maneuver Exercise (PRIME): User's Guide and Videotape

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This report describes the development of a User's Guide and Videotape on the Precision Range Integrated Maneuver Exercise (PRIME). PRIME is a device-based training system developed by the Project Manager for Training Devices (PM TRADE) to help armor and mechanized infantry units meet their gunnery and tactical training needs. The PRIME User's Guide and Videotape provide unit leaders with training materials to support the integration of PRIME into unit training programs. The User's Guide provides a written description of PRIME and guidance on how to conduct PRIME training. The Videotape shows how the PRIME system and its subsystems and elements operate.

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PRECISION RANGE INTEGRATED MANEUVER EXERCISE (PRIME): USER'S GUIDE AND VIDEOTAPE

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PRECISION RANGE INTEGRATED MANEUVER EXERCISE (PRIME): USER'S GUIDE AND VIDEOTAPE

Introduction

The United States Army faces significant budgetary and manpower constraints due to current political, social, and economic factors at home and abroad. Resources available for military training (e.g., fuel, ammunition, ranges) are shrinking and becoming more competitive. Anticipated changes in the force structure are creating a demand for higher quality recruits from a diminishing manpower pool. Together, these constraints are making it increasingly more difficult to maintain current levels of soldier and unit proficiency by relying on traditional training methodologies.

To meet the challenge, the U.S. Army Training and Doctrine Command (TRADOC) has developed a planning document that contains the strategies and concepts that will guide TRADOC and the Army into the 21st Century. This planning document is called Army Training 2007 (TRADOC PAM 350-4, Coordinating Draft, October 1989) and is based on Army Training 21 (AT-21), a TRADOC concept that provides for the evolutionary transition of Army training programs and systems into the future.

One part of the Army Training 2007 planning document is the Integrated Training Strategy (ITS). The goal of ITS is to bring together and balance the components of training; distributed training, combat training centers (CTCs)/future training sites, and device-based training. Under the device-based component of IST, training aids, devices, simulators, and simulations (TADSS) will be integrated into Army training programs. The need to train forces in fire and maneuver will remain, but training will transition from a device-supported, high-operating tempo (OPTEMPO)/live-fire program to a device-based program that uses significantly lower levels of OPTEMPO/live-fire. Device-based training, therefore, will consist of a mix of field training and simulators for individual training and simulations for unit training through the battalion level. In concordance with this component of ITS, the Project Manager for Training Devices (PM TRADE) has developed a training system called the Precision Range Integrated Maneuver Exercise (PRIME).

Background

Development of PRIME

In August 1987, at the request of the Commanding General (CG) III Corps, Fort Hood, Texas, personnel from the U.S. Army Training Support Center (USATSC) conducted a training assistance visit. (Directorate for Army Ranges and Targets, Combat Training Center, 1987). Based on the results of their visit, the CG III Corps initiated the need for a training device that would assist units in preparing for the collective task of movement-to-contact

or meeting engagement. Shortly thereafter, representatives from III Corps and PM TRADE met and developed a concept for a device-based training system that would focus on individual/crew weapons qualification and platoon/company level tactical training for mechanized infantry and armor units.

In May 1988, PM TRADE contracted with LORAL Electro-Optical System to build a prototype system on the Phantom Run range at Fort Hood. As work progressed, the training system became known as the Phantom Run Instrumented Multiple Integrated Laser Engagement System (MILES) Enhancement or PRIME. Also, TRADOC designated the Test and Experimentation Command (TEXCOM) as the test agency and the Combined Arms Center (CAC), Combined Arms Training Activity (CATA), Fort Leavenworth, Kansas as the initial proponent. In November 1988, at the request of the CG TRADOC, the CG U.S. Army Armor School (USAARMS) accepted the proponency for PRIME. Two months later, USATSC reported that in a briefing to GEN Vouno, Chief of Staff, U.S. Army on 2 Dec 1988, the acronym PRIME was renamed to Precision Range Integrated Maneuver Exercise (PM TRADE, Memorandum for Record, January 1988).

In January 1989, a PRIME acquisition strategy was agreed to by III Corps, PM TRADE, TEXCOM, USATSC, USAARMS, and the U.S. Army Infantry School (USAIS) (PM TRADE, Memorandum for Record, January 1989). As part of the acquisition strategy, TEXCOM agreed to conduct a customer test during the April-May 1989 time frame on the capabilities of the Fort Hood PRIME (PM TRADE, Memorandum of Agreement, March 1989). The results of the test would be used to drive a June 1989 contract decision for the fielding of three additional systems to be located at USAARMS, USAIS, and USAREUR. The purpose of the test was to obtain user data regarding four main issues.

(a) Does PRIME satisfy the operation requirements stated in the commercial training device requirement (CTDR) submitted by III Corps?

(b) Does PRIME support tactical training for armor platoons and mechanized infantry?

(c) What resources are required for PRIME?

(d) Is PRIME transportable?

In June 1989, TEXCOM briefed the initial results to PM TRADE; a copy of the final report was submitted to PM TRADE three months later (TCATC, Test Report 88-CT-TCAT-00888, October 1989). Later that month, due primarily to a unacceptable increase in procurement costs, PM TRADE decided against the purchase of the additional PRIME sets. Instead, work efforts were continued with LORAL to complete engineering change proposals (ECPs), block modifications (BLK Mods) and preplanned product improvement (P3I) items (see Appendix A of Kraemer & Koger, 1989).

In July 1990, at the request of the Commander in Chief, U.S. Army Europe (CINCUSAREUR), the Fort Hood PRIME system was shipped to USAREUR for installation at the Third Infantry Division (3ID) in Schweinfurt, Federal Republic of Germany (FRG). An evaluation of PRIME is expected in FY 91 by the Directorate of Training and Doctrine (DOTD), USAARMS (DOTD Memorandum, August 1990).

PRIME Overview

General. PRIME is a device-based training system designed to enhance the engagement simulation capabilities provided by the basic Multiple Integrated Laser Engagement System (MILES), the Laser Target Interface Device (LTID), and the Automatic Tank Target System (ATTS) for conducting force-on-force exercises. The major technical enhancements provided by PRIME are (a) an improved MILES (I-MILES), (b) a Global Positioning System (GPS), (c) a Thru-Sight Video (TSV) subsystem, and (d) a Range Control Computer (RCC).

Purpose. The purpose of PRIME is to support individual, crew and platoon-level tactical and gunnery training of both armor and mechanized infantry units, especially in the areas of (a) fire distribution, (b) maneuver, (c) command and control, and (d) target acquisition. PRIME can be used to prepare individuals and crews for Tank/Bradley Fighting Vehicle (BFV) live-fire gunnery (Combat Tables VII thru XII). It also can be used to prepare platoon-sized units for tactical training during Situational Training Exercises (STXs) or Field Training Exercises (FTXs). PRIME achieves this purpose by means of its automatic data collection and analysis capability. This system capability provides units with objective and near real-time performance data that can be used for immediate feedback during training and for subsequent feedback during their after-action reviews (AARs).

Training/Feedback Capabilities. The training capabilities of PRIME include (a) programmable exercises using live and static targets, (b) built-in test and target activation confirmation, (c) programmable target presentation areas (TPAs), (d) event-driven target engagement scenarios, (e) target visual cuing and shoot-back, and (f) automatic and manual data collection and analysis. The feedback capabilities provided by PRIME include (a) computer printouts (formatted gunnery and tactical exercise reports), (b) a CGI Graphics Map Display, and (c) TSV tapes.

Description of PRIME

PRIME Subsystems and Elements. PRIME is composed of five subsystems and elements. The command and control (C&C) subsystem links, directs and controls all other components of PRIME. It consists of a RCC, computer generated imagery (CGI) Graphics Map Display, transceiver assembly, and a GPS differential receiver. The vehicle subsystem interfaces the RCC with the unit's vehicles. It consists of a PRIME console, GPS receiver, and a transceiver assembly. The target subsystem interfaces the RCC with the PRIME range's targetry. It consists of a PRIME LTID and

a transceiver assembly. The TSV subsystem provides a videotape recording of the gunner's sight picture and an audio recording of vehicle crew interactions. It consists of a video camera linked to the gunner's primary sight extension (GPSE) and wired to a recording module which contains a video cassette recorder (VCR), power source and a video time/date generator that is synchronized with the RCC for a common time code. The after-action review (AAR) subsystem provides the means whereby units can review and critique their gunnery and tactical performance during a PRIME exercise. It consists of an AAR computer, computer printer, CGI Graphics Map Display, four to six VCRs and monitors, and a hand-held remote control device that can be used to synchronize the playback of the VCRs.

PRIME System Operation Before the start of a PRIME exercise, the unit commander provides the RCC operator with a detailed set of instructions for setting-up the range. These instructions include (a) the type, location and number of targets to be presented in the exercise; (b) the TPA for each target; (c) the type of weapon system and ammunition load for each target and vehicle; (d) the target-up, target-down and target shoot-back times; (e) the connection or link between targets; and (f) the depleting target array. The instructions are programmed in the RCC and become the initialization data that the C&C subsystem transmit by radio frequency to each vehicle and target.

During a PRIME exercise, the RCC requests (polls) each vehicle to transmit its location and status. At the same time it polls each target to transmit its status, up or down. This polling of vehicles and targets takes place every three to five seconds and occurs continuously during an exercise. When the RCC determines a vehicle has entered a TPA, it signals targets with that TPA to come up. The targets than transmit their status, up or down, at the next polling. If a target reports it's still down, the RCC will automatically signal an alternate target with that TPA to come up.

A vehicle engages a target by sending out an I-MILES laser beam which contains its weapon and vehicle identification codes. The engagement data (weapon and vehicle identification codes, firing time) are stored in the vehicle's PRIME console and transmitted to the RCC at the next polling. The target's PRIME LTID determines whether the I-MILES laser beam is strong enough to register a hit. If a hit is registered, it determines the outcome of the engagement; the target is killed, hit but not killed, or near-missed. The PRIME LTID makes this determination by entering into a Monte Carlo routine (chance table) that is based on weapon fired and target vulnerability. Accordingly, it signals the target to respond (stay up or fall). The engagement data (weapon and vehicle identification codes, engagement time, and engagement outcome) are than transmitted to the RCC at the next polling.

If a target is not killed within the time set by the unit's initialization data, the RCC signals the vehicle to record an

I-MILES hit from the target. The vehicle's PRIME console responds accordingly and transmits the results to the RCC at the next polling.

During a PRIME exercise, all vehicle movements (time-coded vehicle position locations), engagements, and engagement outcomes are stored in the RCC. At the end, the data are down-loaded onto a computer diskette and provided for use during the unit's AAR.

Problem

At the request of PM TRADE, researchers at the U.S. Army Research Institute (ARI) Field Unit at Fort Knox conducted interviews with III Corps commanders who trained their tank platoons using PRIME during the customer test (Kraemer & Koger, 1989). The purpose of the interviews was to obtain unit commander perceptions regarding three main issues:

(a) Which tasks from the Mission Essential Task List (METL) can be trained using PRIME?

(b) What changes or enhancements are needed (given its present capabilities) to improve PRIME?

(c) Where can PRIME be used (given its potential capabilities) in the unit's overall training strategy?

The results of the interviews indicated that unit commanders did not understand how to (a) use PRIME when they arrived at the range for training and (b) use the computer printouts provided by PRIME for the AAR. Collectively, they recommended that training materials be developed to support the integration of PRIME into unit training programs. They felt that without such materials commanders would not be able to realize the full benefits of PRIME in helping meet their training requirements.

Accordingly, PM TRADE requested the technical assistance of the ARI to develop (a) AAR formats for presenting performance outcome measures, (b) procedures for conducting PRIME AARs, (c) a PRIME user's guide, and (d) a training videotape on the PRIME system. The first two efforts were completed by the ARI Field Unit located in Orlando, Florida and are presented in the report Conducting Precision Range Integrated Maneuver Exercise (PRIME) After-Action Reviews. (Witmer, 1990). The last two efforts were completed by the ARI Fort Knox Field Unit located at Fort Knox, Kentucky. The results are described in the report Precision Range Integrated Maneuver Exercise (PRIME) User's Guide (Kraemer & Koger, in preparation) and the training videotape titled PRIME System Operation (Koger & Kraemer, 1990).

Purpose

The purpose of this document is to describe the procedures used to produce the PRIME User's Guide and the videotape and to provide a brief summary of the training materials.

Procedure

PRIME User's Guide

A four step procedure was followed to produce a user's guide on PRIME. The first step was to become more knowledgeable about the PRIME system and Army training doctrine. In terms of PRIME, this was done by (a) reviewing PRIME documentation, principally the report Phantom Run Instrumented MILES Enhanced(PRIME) System Capabilities Overview (U.S. Army, III Corps, G-3 Training, 1988) and (b) meeting with PM TRADE, III Corps and contractor personnel directly involved in the development of the PRIME system. In terms of Army training doctrine, this was accomplished by (a) reviewing the Army's training doctrine as described in FM 25-100 Training the Force (Department of the Army, 1988) and (b) meeting with military commanders and USAARMS DOTD civilian personnel to discuss PRIME training issues. Because of ongoing improvements in PRIME system equipment and software and the resulting affects on system training capabilities and limitations, this review and discussion process was continued throughout the research effort.

The next step was to develop a user's guide outline based on the information available about PRIME. In developing the outline, the data were organized into two chapters with paragraph and topic/subtopic headings. The first chapter was "PRIME Description" and contained four paragraph headings: (a) Introduction, (b) PRIME System Operation, (c) PRIME Subsystem and Elements, and (d) Site Organization. Chapter II was titled "Conducting PRIME Training" and contained nine major headings: (a) Introduction, (b) PRIME Training Requirements, (c) Levels of PRIME Training, (d) PRIME Orientation, (e) Planning PRIME Training, (f) Implementing PRIME Training, (g) Evaluating PRIME Training, (h) Summary of Responsibilities, and (i) Training Recommendations. This initial outline was submitted to PM TRADE for review and approved, following minor modifications.

The third step was to adopt a user's guide format that could present the information in a manner acceptable to the intended audience (i.e., unit commanders at the platoon, company and battalion levels). Several user's guides developed for the Army and other Department of Defense (DOD) agencies, as well as those developed by ARI, were reviewed. Because a standard format was not found, it was decided to use the format developed for the Simulation Networking (SIMNET) system (USAARMS, 1989).

The final step was to write the user's guide using the basic outline and selected guide format. In performing this step, narrative descriptions were written for each chapter paragraph and topic/subtopic headings. To ensure completeness, additional topics/subtopics were included wherever necessary. In this manner, two diagrams were included in the first chapter to help illustrate PRIME system operation and PRIME subsystems and elements. In the second chapter, on the topic of selecting platoon-level tasks for PRIME training, a training matrix was developed to assist unit leaders perform this task more

efficiently. The training matrix, which was developed based on ARTEP 17-237-10-MTP, Mission Training Plan for the Tank Platoon (Department of the Army, 1988), was put in an appendix. A preface, table of contents, and a glossary defining the acronyms and abbreviations were prepared to complete the user's guide. A copy of the draft document was submitted to PM TRADE for review. It was also submitted for peer review to ARI research staff members at the Fort Knox and Fort Benning Field Units. Following minor revisions, the document was accepted and approved by PM TRADE (Kraemer & Koger, in preparation).

PRIME Videotape

In developing a videotape on PRIME system operation, it was agreed by ARI and PM TRADE to use the information provided in Chapter 1 of the PRIME User's Guide (i.e., PRIME Description). The rationale was that it would provide a solid foundation on which a training videotape could be developed while ensuring standardization of subject matter content. As a result of this decision, a four-step procedure was followed.

The initial step was to develop a preliminary script for the videotape. This was accomplished by dividing the script into meaningful units or parts, identifying and describing the live footage or graphics required to portray each part, writing the script narration and preparing prototype graphics, and then revising the script following PM TRADE review, as necessary.

The second step was to develop the videotape footage called for in the script. This was accomplished by reviewing, selecting and incorporating relevant footage from the TEXCOM videotapes previously produced on PRIME (Phantom Run Instrumented MILES Enhanced (PRIME) [Kazmierski, 1988], PRIME Test [Kazmierski & Lucas, 1989], PRIME Test II [Lucas, 1989]), and then videotaping whatever additional equipment footage was needed to complete the remainder of the script.

The next step was to develop the supportive materials that were necessary to tie the videotape footage together. This step, performed with the help of Specialist Lucas from the Audio-Visual Section, Test and Experimentation Command (TEXCOM), Fort Hood, Texas, involved producing the background music for use during the introduction, the animation sequence, and end of the videotape, developing the graphics and animation requirements, and getting the script narration recorded on videotape.

The final step was to produce and edit the videotape. This was done by putting together and editing all of the various elements (live footage, graphics, animation, background music, and script narration) developed during the previous steps. After the videotape was produced, a copy was submitted to PM TRADE for review and comment. Based on this review, a condensed version of the videotape (removal of the summary of subsystems and elements) was produced. A copy of the training videotape (narrated script, graphics and videotape footage) is presented in Appendix A.

Summary

Training materials were developed to support the integration of PRIME into both armor and mechanized infantry unit training programs. The materials are intended primarily for unit leaders (battalion and company commanders, master gunners, platoon leaders and sergeants) who are considering using PRIME to help meet their gunnery and tactical training needs. The training materials, as described in the following paragraphs, are currently being used by 3ID unit commanders in USAREUR.

The PRIME User's Guide is a user-oriented training document on the device-based training system. The Guide consists of two major chapters, an appendix and a glossary. The first chapter provides unit leaders with a introduction to PRIME while describing its purpose and training capabilities and limitations. The chapter also provides the user with a description of the PRIME system, including system operation, subsystems and elements, and site organization. The second chapter provides unit leaders with an introduction to training with PRIME while describing PRIME training requirements, levels of training, and orientation. The chapter also provides them with detailed guidance for planning, implementing and evaluating individual, crew and platoon-level training using PRIME. The training matrix in Appendix A of the User's Guides provides unit leaders with assistance in selecting tank platoon-level tasks for PRIME training. The glossary defines all of the acronyms and abbreviations used in the Guide.

PRIME System Operation is a 20-minute training videotape on the device-based training system. The videotape begins with a narrated introduction to PRIME while presenting background music and live footage of an M1 Abrams tank platoon maneuvering and engaging targets on an instrumented range. This is followed by a narrated description of graphics showing the various technical enhancements provided by PRIME, its purpose, and its primary capabilities and limitations. A narrated graphical description of how the various components of the PRIME system interact and operate during a tactical and gunnery engagement exercise is then presented. This description is followed by an animated graphical representation of how the PRIME system operates during a single tank-target engagement. The training videotape continues with a narrated description of the subsystems and elements that comprise PRIME while showing related graphics and live footage of equipment components. The videotape ends with a statement on PRIME while presenting background music and live footage of several M1 tanks departing from the range.

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APPENDIX A

PRIME System Operation - Script

PRIME SYSTEM OPERATION - SCRIPT

(**SHOW VIDEO-1**) ARMOR AND MECHANIZED INFANTRY UNITS MUST BE ABLE TO ENGAGE AND DESTROY THE ENEMY WHENEVER THEY MEET ON THE BATTLEFIELD. TO MEET THIS OBJECTIVE, UNITS MUST BE HIGHLY TRAINED IN INDIVIDUAL, CREW AND PLATOON TACTICS AND GUNNERY SKILLS.

TO PROVIDE ARMOR AND MECHANIZED INFANTRY UNITS WITH A MEANS FOR PRACTICING THEIR INDIVIDUAL, CREW AND PLATOON TACTICS AND GUNNERY SKILLS, (**SHOW VIDEO-2**) THE PROJECT MANAGER FOR TRAINING DEVICES (PM TRADE) IS PROCURING A TRAINING DEVICE CALLED (**SHOW CGI-1 AS A CAPTION AT TOP OF VIDEO-2**) PRIME -- PRECISION RANGE INTEGRATED MANEUVER EXERCISE.

(**SHOW CGI-2**) PM TRADE CONSIDERS PRIME A TECHNICAL ENHANCEMENT TO THE CURRENT CAPABILITIES PROVIDED BY (**SHOW CGI-3**) THE BASIC MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES), (**SHOW CGI-4**) THE LASER TARGET INTERFACE DEVICE (LTID), AND (**SHOW CGI-5**) THE AUTOMATIC TANK TARGET SYSTEM (ATTS). (**SHOW CGI-6**) THE TECHNICAL ENHANCEMENTS TO PRIME ARE (**SHOW CGI-7**) AN IMPROVED MILES (I-MILES) WITH PLAYER IDENTIFICATION, (**SHOW CGI-8**) A GLOBAL POSITIONING SYSTEM (GPS), (**SHOW CGI-9**) A THRU-SIGHT VIDEO (TSV) SUBSYSTEM, AND (**SHOW CGI-10**) A PRIME COMPUTER TO TIE THE COMPONENTS TOGETHER.

(**SHOW VIDEO-3**) THE PURPOSE OF PRIME IS TO SUPPORT ARMOR AND MECHANIZED INFANTRY UNIT AND LEADER TRAINING IN THE AREAS OF (**ADD "FIRE DISTRIBUTION" AT BOTTOM OF THE SCREEN**) FIRE DISTRIBUTION, (**REPLACE "FIRE DISTRIBUTION" WITH "MANEUVER"**) MANEUVER, (**REPLACE "MANEUVER" WITH "COMMAND AND CONTROL"**) COMMAND AND CONTROL, (**REPLACE "COMMAND AND CONTROL" WITH "TARGET ACQUISITION"**) AND TARGET ACQUISITION.

(**SHOW VIDEO-4**) SIGNIFICANT PRIME CAPABILITIES INCLUDE PROGRAMMABLE SCENARIOS USING (**SHOW VIDEO-5 WITH "LIVE AND STATIC TARGETS" AT BOTTOM OF SCREEN**) LIVE AND STATIC TARGETS, (**SHOW VIDEO-6 WITH "EVENT-DRIVEN TARGET ENGAGEMENTS" AT BOTTOM OF SCREEN**) EVENT-DRIVEN TARGET ENGAGEMENTS, (**SHOW VIDEO-7 WITH "TARGET VISUAL CUING" AT BOTTOM OF SCREEN**) TARGET VISUAL CUING, (**SHOW VIDEO-8 WITH "TARGET SHOOT-BACK" AT BOTTOM OF SCREEN**) TARGET SHOOT-BACK, (**SHOW VIDEO-9 WITH "AUTOMATIC DATA COLLECTION" AT BOTTOM OF SCREEN**) AUTOMATIC DATA COLLECTION, (**SHOW VIDEO-10 WITH "BUILT IN TEST AND TARGET ACTIVATION" AT BOTTOM OF SCREEN**) BUILT-IN-TEST AND TARGET ACTIVATION CONFIRMATION, AND (**SHOW VIDEO -11 WITH "PROGRAMMABLE TARGET PRESENTATION AREAS" AT BOTTOM OF SCREEN**) PROGRAMMABLE TARGET PRESENTATION AREAS (TPAs).

(**SHOW VIDEO-12**) THE FEEDBACK CAPABILITIES PROVIDED BY PRIME INCLUDE (**SHOW VIDEO-13**) FORMATTED GUNNERY AND TACTICAL EXERCISE REPORTS, (**SHOW VIDEO-14**) THE COMPUTER GRAPHICS MAP DISPLAY, AND (**SHOW VIDEO-15**) THRU-SIGHT VIDEOTAPES. (**SHOW VIDEO-16**) COPIES OF THE COMPUTER PRINTOUTS AND TSV TAPES ARE ALSO PROVIDED FOR TAKE-HOME REVIEW AND FEEDBACK.

(**SHOW VIDEO-17**) THE WAY PRIME OPERATES IS VERY EASY TO UNDERSTAND. (**SHOW VIDEO-18**) BEFORE THE START OF A PRIME EXERCISE, THE UNIT COMMANDER FURNISHES AN EXERCISE OR SCENARIO TO THE PRIME COMPUTER OPERATOR. (**SHOW CGI-11**) THIS INFORMATION BECOMES THE INITIALIZATION DATA THAT THE COMMAND AND CONTROL SUBSYSTEM TRANSMITS BY RADIO FREQUENCY TO THE UNIT'S VEHICLES AND (**SHOW CGI-12**) TARGETS.

(**SHOW CGI-13**)DURING A PRIME EXERCISE, THE COMMAND AND CONTROL SUBSYSTEM POLLS EACH VEHICLE AND TARGET EVERY 3 TO 5 SECONDS TO TRANSMIT (**SHOW CGI-14**) ITS STATUS AND LOCATION. (**SHOW CGI-15**) WHEN A VEHICLE ENTERS A TARGET PRESENTATION AREA, THE COMMAND AND CONTROL SUBSYSTEM (**SHOW CGI-16**) SIGNALS TARGETS WITH THAT PRESENTATION AREA TO COME UP. (**SHOW CGI-17**) THE VEHICLE ENGAGES A TARGET BY SENDING AN I-MILES LASER BEAM AT THE TARGET'S LTID. THIS LASER BEAM CONTAINS THE WEAPON AND VEHICLE IDENTIFICATION CODES. (**SHOW CGI-18**) THE VEHICLE TRANSMITS ITS ENGAGEMENT DATA INCLUDING (**SHOW CGI-19**) TIME, (**SHOW CGI-20**) WEAPON, (**SHOW CGI-21**) LOCATION AND (**SHOW CGI-22**) VEHICLE ID (**SHOW CGI-23**) TO THE COMMAND AND CONTROL SUBSYSTEM IN RESPONSE TO THE NEXT POLLING. (**SHOW CGI-24**) WHEN THE VEHICLE'S I-MILES LASER BEAM (**SHOW CGI-25**) STRIKES A TARGET'S LTID SENSOR, THE TARGET'S PRIME LTID WILL DETERMINE WHETHER THE TARGET IS KILLED OR HIT BUT NOT KILLED. ACCORDINGLY, (**SHOW CGI-26**) IT SIGNALS THE ATTS TO STAY UP OR (**SHOW CGI-27**) FALL DOWN. (**SHOW CGI-28**) THIS ENGAGEMENT DATA (**SHOW CGI-29**) FIRING RESULTS, (**SHOW CGI-30**) TIME, (**SHOW CGI-31**) VEHICLE ID AND (**SHOW CGI-32**) WEAPON CODE) (**SHOW CGI-33**) IS THEN TRANSMITTED BY THE TARGET TO THE COMMAND AND CONTROL SUBSYSTEM AT THE NEXT POLLING. (**SHOW CGI-34**) (**SHOW CGI-35**) IF A TARGET IS NOT KILLED WITHIN THE TIME SET BY THE SCENARIO, THE COMMAND AND CONTROL SUBSYSTEM (**SHOW CGI-36**) WILL SIGNAL THE VEHICLE TO RECORD A SHOOT-BACK EVENT FROM THE TARGET. (**SHOW CGI-37**) THIS CAUSES THE VEHICLE'S PRIME CONSOLE TO ENTER INTO A MONTE CARLO ROUTINE TO DETERMINE THE OUTCOME OF THE ENGAGEMENT (HIT, KILL OR NEAR-MISS). THE VEHICLE'S PRIME CONSOLE WILL RESPOND ACCORDINGLY, (**SHOW CGI-38**) AND TRANSMIT THE RESULT TO THE COMMAND AND CONTROL SUBSYSTEM AT THE NEXT POLLING.

(**START TO ERASE SCREEN. HAVE ONLY BLUE SCREEN BY "SIMULATION"**) THIS IS HOW PRIME OPERATES. TO HELP YOU BETTER VISUALIZE THE GRAPHICS THAT HAVE BEEN PRESENTED, PAY CLOSE ATTENTION TO THE FOLLOWING SIMULATION. (**SHOW CGI-39**) IT WILL PRESENT AN ENTIRE TARGET ENGAGEMENT USING PRIME (**SHOW THE "SIMULATION"**).

SIMULATION
SIMULATION SHOWS TANK APPROACHING TARGET, POLLING CUE GOING TO THE VEHICLE AND TARGET, TARGET GETTING INSTRUCTIONS TO COME UP AND THEN VEHICLE ENGAGING THE TARGET.

(**SHOW VIDEO-19**) THIS ENDS OUR DISCUSSION ON HOW PRIME OPERATES. KEEP IN MIND THAT DURING AN EXERCISE ALL VEHICLE MOVEMENTS, ENGAGEMENTS AND ENGAGEMENT OUTCOMES ARE STORED IN THE PRIME COMPUTER. WHEN THE EXERCISE IS COMPLETED, THESE DATA ARE DOWNLOADED AND MADE AVAILABLE TO THE UNIT FOR USE DURING ITS AFTER-ACTION REVIEW. (**SHOW BLUE SCREEN**)

(**SHOW CGI-40**) NOW THAT YOU KNOW HOW PRIME OPERATES, (**SHOW CGI-41**) LET'S TAKE A LOOK AT THE SUBSYSTEMS THAT MAKE UP PRIME. FIRST OF ALL, PRIME CONSIST OF FIVE SUBSYSTEMS. (**SHOW CGI-42**) THERE IS THE COMMAND AND CONTROL SUBSYSTEM, (**SHOW CGI-43**) THE VEHICLE SUBSYSTEM, (**SHOW CGI-44**) THE THRU-SIGHT VIDEO SUBSYSTEM, (**SHOW CGI-45**) THE TARGET SUBSYSTEM, (**SHOW CGI-46**) AND THE AFTER-ACTION REVIEW (AAR) SUBSYSTEM. TOGETHER, (**SHOW CGI-47**) THEY CONSTITUTE THE PRIME SYSTEM.

LET'S TAKE A FEW MINUTES TO EXAMINE EACH OF THE FIVE SUBSYSTEMS THAT CONSTITUTE PRIME. (**SHOW CGI-48**) THE FIRST SUBSYSTEM WE WANT TO LOOK AT IS CALLED THE COMMAND AND CONTROL SUBSYSTEM. IT CONSISTS OF (**SHOW CGI-49**) THE PRIME COMPUTER, THE (**SHOW CGI-50**) CGI GRAPHICS MAP DISPLAY, A (**SHOW CGI-51**) TRANSCEIVER ASSEMBLY, AND (**SHOW CGI-52**) A GLOBAL POSITIONING SYSTEM (GPS) DIFFERENTIAL RECEIVER.

(**SHOW CGI-53**) THE FIRST ELEMENT, (**SHOW VIDEO-20**) THE PRIME COMPUTER, IS CONSIDERED THE BRAINS OF THE PRIME SYSTEM. IT IS LOCATED IN THE COMMAND AND CONTROL AREA OF THE PRIME SITE AND LINKS, CONTROLS AND DIRECTS ALL THE OTHER COMPONENTS OF PRIME.

(**SHOW VIDEO-21**) "THE SECOND ELEMENT OF THE COMMAND AND CONTROL SUBSYSTEM IS THE CGI GRAPHICS MAP DISPLAY. THE CGI GRAPHICS MAP DISPLAY (**SHOW VIDEO-22**) TAKES DATA AVAILABLE IN THE PRIME COMPUTER AND (**SHOW VIDEO-23**) SUPERIMPOSES VEHICLE AND TARGET INFORMATION ON A HIGH RESOLUTION TACTICAL MAP OF THE RANGE. (**SHOW VIDEO-24**) THIS TACTICAL MAP CAN SHOW CLOSE-UP VIEWS OF THE PRIME RANGE, (**SHOW VIDEO-25**) VEHICLE MOVEMENT, (**SHOW VIDEO-26**) VEHICLE TO TARGET HIT, (**SHOW VIDEO-27**) NEAR MISS, (**SHOW VIDEO-28**) TARGET KILL, AND (**SHOW VIDEO-29**) TARGET SHOOT-BACK KILL. THE MANY OTHER CAPABILITIES OF THE GRAPHICS MAP DISPLAY CAN BE DEMONSTRATED TO THE USER BY THE PRIME STAFF.

(**SHOW CGI-54**) THE THIRD ELEMENT OF THE COMMAND AND CONTROL SUBSYSTEM IS THE COMMAND AND CONTROL TRANSCEIVER ASSEMBLY. (**SHOW VIDEO-29A**) THE COMMAND AND CONTROL TRANSCEIVER ASSEMBLY INTERFACES WITH THE PRIME COMPUTER TO PROVIDE (**SHOW CGI-55**) A TWO-WAY RADIO FREQUENCY DATA COMMUNICATIONS TELEMETRY NETWORK TO AND FROM TRANSCEIVER ASSEMBLIES WITHIN THE VEHICLE AND TARGET SUBSYSTEMS.

THE LAST ELEMENT OF THE COMMAND AND CONTROL SUBSYSTEM IS THE GLOBAL POSITIONING SYSTEM (GPS) DIFFERENTIAL RECEIVER (**SHOW CGI-56**). THE GPS DIFFERENTIAL RECEIVER (**SHOW VIDEO-30**) PROVIDES CORRECTION FACTORS TO THE POSITION LOCATION RECEIVED BY THE PRIME COMPUTER FROM EACH VEHICLE TO OBTAIN A MORE ACCURATE POSITION LOCATION FOR THAT VEHICLE (**SHOW CGI-57**). THIS CORRECTED POSITION

LOCATION DATA IS USED IN TARGET PRESENTATION, DISPLAY ON THE CGI GRAPHICS MAP AND STORAGE FOR LATER USE. FOR EXAMPLE, THE PRODUCTION OF REPORTS AND TRANSFER OF DATA TO THE PRIME COMPUTER AT THE AAR SITE.

(**SHOW CGI-58**) THE NEXT PRIME SUBSYSTEM WE WANT TO TAKE A (**SHOW CGI-59**) CLOSER LOOK AT IS CALLED THE VEHICLE SUBSYSTEM. THE VEHICLE SUBSYSTEM CONSISTS OF (**SHOW CGI-60**) THE PRIME CONSOLE, (**SHOW CGI-61**) THE GLOBAL POSITIONING SYSTEM (GPS) RECEIVER, AND (**SHOW CGI-62**) THE TRANSCEIVER ASSEMBLY.

(**SHOW VIDEO-31**) THE PRIME CONSOLE REPLACES THE UNIT'S STANDARD MILES CONSOLE. (**SHOW VIDEO-32**) THE PRIME CONSOLE PROVIDES THE SAME BASIC FUNCTIONS AND CONTROLS AS MILES, (**SHOW CGI-63**) BUT INTERFACES WITH THE COMMAND AND CONTROL SUBSYSTEM THROUGH THE VEHICLE TRANSCEIVER ASSEMBLY.

(**SHOW CGI-64**) THE PRIME CONSOLE RECEIVES AND STORES INITIALIZATION DATA FROM THE COMMAND AND CONTROL SUBSYSTEM. THE INITIALIZATION DATA INCLUDES: (**SHOW CGI-65**) TYPE OF VEHICLE, (**SHOW CGI-66**) MILES WEAPONS MESSAGES, (**SHOW CGI-67**) NUMBER OF ROUNDS FOR EACH WEAPON SYSTEM, AND (**SHOW CGI-68**) THE TIME SYNCHRONIZATION OF THE PRIME CONSOLE'S INTERNAL CLOCK TO THAT OF THE COMMAND AND CONTROL SUBSYSTEM'S INTERNAL CLOCK FOR A COMMON TIME CODE.

(**SHOW CGI-69**) EACH PRIME CONSOLE HAS A UNIQUE (**SHOW CGI-70**) PLAYER IDENTIFICATION CODE THAT IS INTEGRATED INTO THE MILES LASER BEAM. (**SHOW CGI-71**) THIS PROVIDES I-MILES WITH A PLAYER IDENTIFICATION CAPABILITY. THIS CAPABILITY ALLOWS PRIME TO RECORD WHO SHOT WHOM AND TAG EACH EVENT WITH (**SHOW CGI-72**) TIME AND (**SHOW CGI-73**) POSITION LOCATION.

AS UPDATES ARE RECEIVED FROM THE VEHICLE POSITION LOCATION DEVICE, THEY ARE TIME-TAGGED IN THE PRIME CONSOLE. (**SHOW CGI-74**) WHEN THE PRIME CONSOLE RECEIVES INSTRUCTIONS TO TRANSMIT DATA (POLLING CUES) FROM THE COMMAND AND CONTROL SUBSYSTEM, (**SHOW CGI-75**) IT TRANSMITS RECORDED DATA, IN NEAR REAL-TIME, BACK TO THE COMMAND AND CONTROL SUBSYSTEM FOR DISPLAY, RECORDING AND PROCESSING. (**SHOW CGI-76**) THE PRIME CONSOLE ALSO RECEIVES AND PROCESSES TARGET (**SHOW CGI-77**) SHOOT-BACK AND (**SHOW CGI-78**) MANUAL COMMANDS FROM THE COMMAND AND CONTROL SUBSYSTEM. (**SHOW CGI-78**) SHOOT-BACK COMMANDS SIMULATE THAT THE VEHICLE IS BEING ENGAGED BY THE TARGET. IN THIS SITUATION, THE COMMAND AND CONTROL SUBSYSTEM SENDS A COMMAND OF HIT. THE PRIME CONSOLE TRANSLATES THESE COMMANDS INTO MILES ACTIONS, JUST AS IF THE VEHICLE HAD RECEIVED A MILES LASER WEAPON MESSAGE. THE PRIME COMPUTER OPERATOR CAN SEND (**SHOW CGI-79**) THE ADDITIONAL (**SHOW CGI-80**) MANUAL COMMANDS OF (**SHOW CGI-81**) RESET AND (**SHOW CGI-82**) RESURRECT. (**SHOW CGI-83**) THE COMMAND "RESET" CAUSES THE PRIME CONSOLE TO CHANGE ALL VALUES TO THOSE AT THE START OF THE SCENARIO (INITIALIZATION DATA). (**SHOW PRIME-84**)THE COMMAND "RESURRECT" DIRECTS THE PRIME CONSOLE TO BRING THE VEHICLE BACK TO LIFE.

(**SHOW CGI-85**) THE PRIME CONSOLE IS LINKED TO THE SECOND ELEMENT OF THE VEHICLE SUBSYSTEM, THE VEHICLE TRANSCEIVER ASSEMBLY WHICH PROVIDES THE RADIO LINK FROM THE VEHICLE SUBSYSTEM TO THE COMMAND AND CONTROL SUBSYSTEM. (**SHOW VIDEO-33**) THE VEHICLE TRANSCEIVER ASSEMBLY IS (**SHOW VIDEO-34**) HOUSED IN A 7.62 MM AMMUNITION CAN (**SHOW VIDEO-35**) AND HAS A SMALL ANTENNA.

(**SHOW CGI-86**) THE THIRD ELEMENT OF THE VEHICLE SUBSYSTEM IS THE GPS RECEIVER. (**SHOW VIDEO-36**) THE GPS RECEIVER IS A POSITION LOCATION DEVICE THAT CONTINUALLY REPORTS THE POSITION OF THE VEHICLE TO THE PRIME CONSOLE FOR (**SHOW CGI-87**) STORAGE AND TRANSMISSION TO THE PRIME COMPUTER WITH THE CORRECTION FACTOR PROVIDE BY THE GPS DIFFERENTIAL RECEIVER, THE POSITION LOCATION STORED BY THE PRIME COMPUTER IS ACCURATE TO PLUS OR MINUS 10 METERS.

(**SHOW CGI-88**) THE NEXT PRIME SUBSYSTEM WE WANT TO TAKE A LOOK AT IS CALLED (**SHOW CGI-89**) THE THRU-SIGHT VIDEO (TSV) SUBSYSTEM. THE TSV DESCRIBED IN THIS VIDEOTAPE IS BEING REPLACED BUT WILL FUNCTION BASICALLY THE SAME AND IS SMALLER AND EASIER TO INSTALL. (**SHOW CGI-90**) THE TSV SUBSYSTEM CONSISTS OF A TV CAMERA (**SHOW CGI-91**) AND A RECORDING MODULE. (**SHOW VIDEO-37**) THE TSV TV CAMERA IS OPTICALLY LINKED TO THE (**SHOW VIDEO-38**) GUNNER'S PRIMARY SIGHT EXTENSION (GPSE) (**SHOW VIDEO-39**) AND WIRED TO A RECORDING MODULE. (**SHOW VIDEO-40**) THIS RECORDING MODULE CONTAINS A VCR, (**SHOW VIDEO-41**) POWER SOURCE, (**SHOW VIDEO-42**) AND A VIDEO TIME/DATE GENERATOR THAT IS SYNCHRONIZED WITH THE COMMAND AND CONTROL SUBSYSTEM FOR A COMMON TIME CODE. (**SHOW VIDEO-43**) THE VIDEO TIME/DATE GENERATOR CREATES A VISUAL INDICATOR ON THE VIDEO RECORDING AND (**SHOW VIDEO-44**) INDICATES THE INSTANT THE GUNNER PULLS THE TRIGGER. IN ADDITION TO A VIDEO OF THE GUNNER'S SIGHT PICTURE, THE TSV ALSO PROVIDES AN AUDIO RECORDING OF CREW INTERACTION DURING THE TRAINING.

(**SHOW CGI-92**) THE NEXT PRIME SUBSYSTEM WE WANT TO TAKE A LOOK AT (**SHOW CGI-93**) IS THE TARGET SUBSYSTEM. THE TARGET SUBSYSTEM INTERFACES THE COMMAND AND CONTROL SUBSYSTEM WITH THE SITE'S TARGETRY AND CONSISTS OF (**SHOW CGI-94**) A PRIME LTID AND (**SHOW CGI-95**) A TARGET TRANSCEIVER ASSEMBLY.

(**SHOW VIDEO-45**) THE PRIME LTID IS A MODIFIED MILES LTID THAT PROVIDES THE ENHANCED PRIME CAPABILITIES -- FOR EXAMPLE, VEHICLE IDENTIFICATION. (**SHOW VIDEO-46**) THE PRIME LTID IS ENCASED IN A MODIFIED 50 CALIBER AMMUNITION CAN AND CAN BE USED AS A STANDARD MILES LTID USING THE SELECTOR SWITCH. (**SHOW CGI-96**) THE PRIME LTID ALSO CONTAINS A SENSOR THAT DETERMINES WHETHER THE TARGET IS UP OR DOWN. (**SHOW CGI-97**) THIS UP/DOWN STATUS OF TARGETS IS CONTINUOUSLY TRANSMITTED BY THE TARGET SUBSYSTEM (**SHOW CGI-98**) TO THE COMMAND AND CONTROL SUBSYSTEM.

(**SHOW VIDEO-47**) THE TARGET TRANSCEIVER ASSEMBLY IS ENCASED IN A 7.62 MM AMMUNITION CAN AND (**SHOW CGI-99**) LINKS WITH THE PRIME LTID TO INTERFACE WITH THE COMMAND AND CONTROL SUBSYSTEM.

ATTS -- THE AUTOMATIC TANK TARGET SYSTEM -- IS NOT ACTUALLY PART OF THE PRIME SYSTEM BUT (**SHOW VIDEO-48**) IS INTEGRATED INTO THE PRIME SYSTEM THROUGH THE PRIME LTID. ATTS IS AN INTEGRAL PART OF THE PRIME SITE. ADDITIONAL NON-PRIME HARDWARE ON THE RANGE INCLUDES (**SHOW VIDEO-49**) THERMAL BLANKETS, (**SHOW VIDEO-50**) HOSTILE FIRE SIMULATORS (HOFFMAN DEVICE) AND TARGET SILHOUETTES. THIS EQUIPMENT IS CURRENTLY AVAILABLE IN THE ARMY TARGET DEVICE INVENTORY FOR TANK AND INFANTRY FIGHTING VEHICLE (IFV) GUNNERY. LOCAL RANGE PERSONNEL WILL INTEGRATE THE TARGET SUBSYSTEM FROM EXISTING SUPPLIES AND INCORPORATE IT INTO THE PRIME SITE.

(**SHOW CGI-100**) IN SUMMARY, THE VEHICLES AND TARGETS INTERFACE WITH THE PRIME COMMAND AND CONTROL SUBSYSTEM TO PROVIDE ENHANCED ENGAGEMENT AND CASUALTY ASSESSMENT SIMULATION AND TARGET CONTROL.

(**SHOW CGI-101**) THE LAST PRIME SUBSYSTEM WE WANT TO TAKE A LOOK AT IS (**SHOW VIDEO-51**) THE AFTER-ACTION REVIEW -- AAR -- SUBSYSTEM. THE PURPOSE OF THE AAR SUBSYSTEM IS TO PROVIDE EFFECTIVE AND EFFICIENT FEEDBACK THAT CAN BE USED TO REMEDIATE IDENTIFIED TACTICAL AND GUNNERY TRAINING DEFICIENCIES. ONE OF THE DISTINCT ADVANTAGES OF THE PRIME SYSTEM IS THE DATA PROVIDED FOR FEEDBACK AND THE MEANS FOR DELIVERING THAT FEEDBACK TO THE INDIVIDUAL, CREW OR UNIT.

(**SHOW CGI-102**) THE PRIME AAR SUBSYSTEM CONSISTS OF (**SHOW CGI-103**) A PRIME COMPUTER, (**SHOW CGI-104**) A COMPUTER PRINTER, (**SHOW CGI-105**) A CGI GRAPHICS MAP DISPLAY, (**SHOW CGI-106**) TSV VIDEO CASSETTE RECORDERS (VCRs) AND MONITORS, (**SHOW CGI-107**) AND A HAND-HELD REMOTE CONTROL DEVICE TO SYNCHRONIZE THE PLAYBACK OF THE VCRs. ALL OF THIS EQUIPMENT IS CONTAINED IN AN AAR FACILITY LOCATED ON THE PRIME SITE.

(**SHOW VIDEO-52**) THE PRIME COMPUTER IS IDENTICAL TO THE COMPUTER DESCRIBED EARLIER FOR THE COMMAND AND CONTROL SUBSYSTEM. (**SHOW VIDEO-53**) PRINTOUTS FROM THE COMPUTER CAN PROVIDE UNIT COMMANDERS WITH A SUBSTANTIAL AMOUNT OF PERFORMANCE DATA FOR USE DURING THE AAR. (**SHOW VIDEO-54**) FOR EXAMPLE, THE PRINTOUTS CAN GIVE THE UNIT COMMANDER A SUMMARY OF HIS UNIT'S GUNNERY PROFICIENCY BY VEHICLE, (**SHOW VIDEO-55**) AS WELL AS, EACH PLATOON'S TACTICAL PROFICIENCY IN ACCOMPLISHING ITS MISSION. (**SHOW VIDEO-56**) USING THE PRINTER LOCATED IN THE AAR FACILITY, THE UNIT COMMANDER CAN SELECT AND PRINT OUT HARD-COPY RECORDS OF EXERCISE EVENTS USING EITHER PRE-FORMATTED OR CUSTOM-MADE REPORTS.

(**SHOW VIDEO-57**) THE CGI GRAPHICS MAP DISPLAY IS IDENTICAL TO THAT DESCRIBED EARLIER FOR THE COMMAND AND CONTROL SUBSYSTEM. THE UNIT COMMANDER, WITH ASSISTANCE FROM THE AAR SUPPORT STAFF, CAN SELECT AND REVIEW THE TACTICAL AND GUNNERY PERFORMANCE OF HIS UNIT DURING EACH PHASE OF THE EXERCISE. FOR EXAMPLE, HE CAN SELECT AND REVIEW THE GUNNERY ENGAGEMENTS OF A SINGLE VEHICLE AND TARGET STATUS (UP OR DOWN) DURING A BATTLE RUN.

(**SHOW VIDEO-58**) UP TO SIX VIDEO CASSETTE RECORDERS AND MONITORS ARE LOCATED IN THE AAR FACILITY. THESE VCRS AND MONITORS CAN BE USED TO PLAYBACK THE TSV TAPES (**SHOW VIDEO-59**) CONTAINING EVERYTHING SEEN BY THE GUNNERS AND SAID BY THE CREWS DURING THE EXERCISE THE TSV TAPES SHOULD BE PREVIEWED BY UNIT LEADERS PRIOR TO (**SHOW VIDEO-60**) CONDUCTING AN AAR, WITH SIGNIFICANT EVENTS SELECTED TO HIGHLIGHT ONE OR MORE OF EACH VEHICLE CREW'S STRENGTHS AND WEAKNESSES DURING THE AAR. ADDITIONALLY, PRIME SUPPORT STAFF CAN SYNCHRONIZE THE TSV TAPES -- USING A HAND-HELD REMOTE CONTROL DEVICE -- TO SHOW HOW ALL VEHICLE CREWS WERE PERFORMING DURING SELECTED ENGAGEMENT EVENTS. (**SHOW VIDEO-61**) FOR MORE DETAILED ANALYSIS OF INDIVIDUAL CREW PERFORMANCE, THE TSV TAPES CAN BE TAKEN BACK BY THE UNIT AND REVIEWED IN THEIR ENTIRETY.

(**SHOW VIDEO-62**) PRIME -- PRECISION RANGE INTEGRATED MANEUVER EXERCISE -- HAS BEEN PROCURED BY PM TRADE BASED ON THE U.S. ARMY'S "TRAIN AS WE WILL FIGHT" TRAINING STRATEGY. PRIME IS DESIGNED PRIMARILY TO SUPPORT INDIVIDUAL, CREW AND UNIT -- UP TO PLATOON -- TACTICAL AND GUNNERY TRAINING. WITH ITS AUTOMATED DATA COLLECTION AND FEEDBACK CAPABILITIES, PRIME PROVIDES UNIT LEADERS WITH OBJECTIVE AND NEAR REAL-TIME RECORDS TO SUPPORT OBJECTIVE AFTER-ACTION REVIEWS. FURTHER DETAILS ON HOW PRIME OPERATES AND CAN BE USED CAN BE FOUND IN MANUALS AVAILABLE AT EACH PRIME SITE. QUALIFIED MILITARY AND CIVILIAN STAFF ARE ALSO AVAILABLE TO PROVIDE ASSISTANCE.

APPENDIX B

Computer Graphics Imagery (CGI) Slides

CGI-1

PRECISION RANGE INTEGRATED MANEUVER EXERCISE

CGI-2

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

CGI-3

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES)

CGI-4

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES)

LASER TARGET INTERFACE DEVICE (LTID)

CGI-5

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES)

LASER TARGET INTERFACE DEVICE (LTID)

AUTOMATIC TANK TARGET SYSTEM (ATTS)

CGI-6

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIMF

TECHNICAL ENHANCEMENTS

CGI-7

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

TECHNICAL ENHANCEMENTS

IMPROVED MILES (I-MILES) WITH PLAYER ID

CGI-8

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

TECHNICAL ENHANCEMENTS

IMPROVED MILES (I-MILES) WITH PLAYER ID

GLOBAL POSITIONING SYSTEM (GPS)

CGI-9

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

TECHNICAL ENHANCEMENTS

IMPROVED MILES (I-MILES) WITH PLAYER ID

GLOBAL POSITIONING SYSTEM (GPS)

THRU-SIGHT VIDEO (TSV)

CGI-10

PRECISION RANGE INTEGRATED MANEUVER EXERCISE
PRIME

TECHNICAL ENHANCEMENTS

IMPROVED MILES (I-MILES) WITH PLAYER ID

GLOBAL POSITIONING SYSTEM (GPS)

THRU-SIGHT VIDEO (TSV)

PRIME COMPUTER

CGI-11

PRIME

COMMAND AND CONTROL SUBSYSTEM

(PICTURE OF BUILDING)

VEHICLE

(PICTURE OF TANK)

TARGET

(PICTURE OF TANK TARGET)

CGI-12

PRIME

COMMAND AND CONTROL SUBSYSTEM

(PICTURE OF BUILDING)

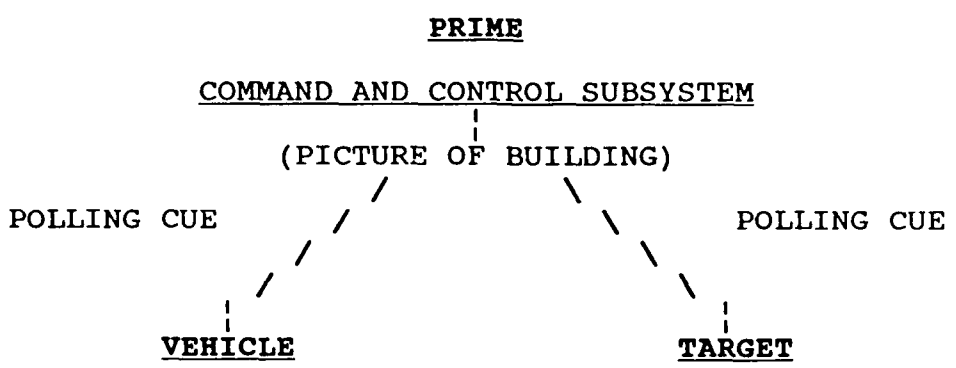
VEHICLE

(PICTURE OF TANK)

TARGET

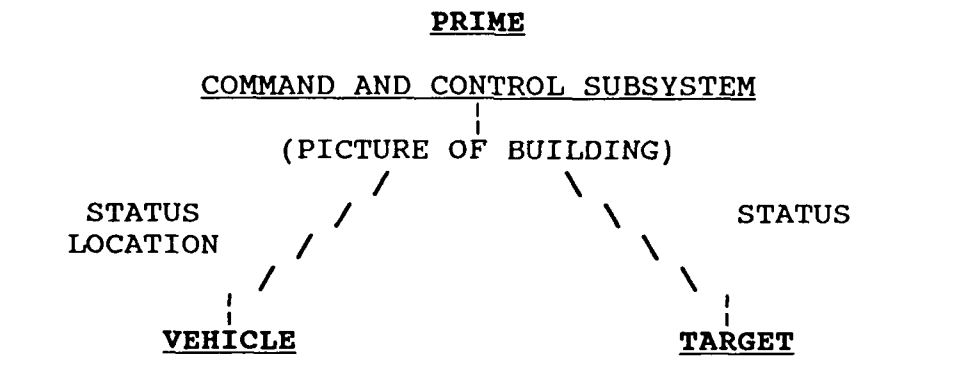
(PICTURE OF TANK TARGET)

CGI-13



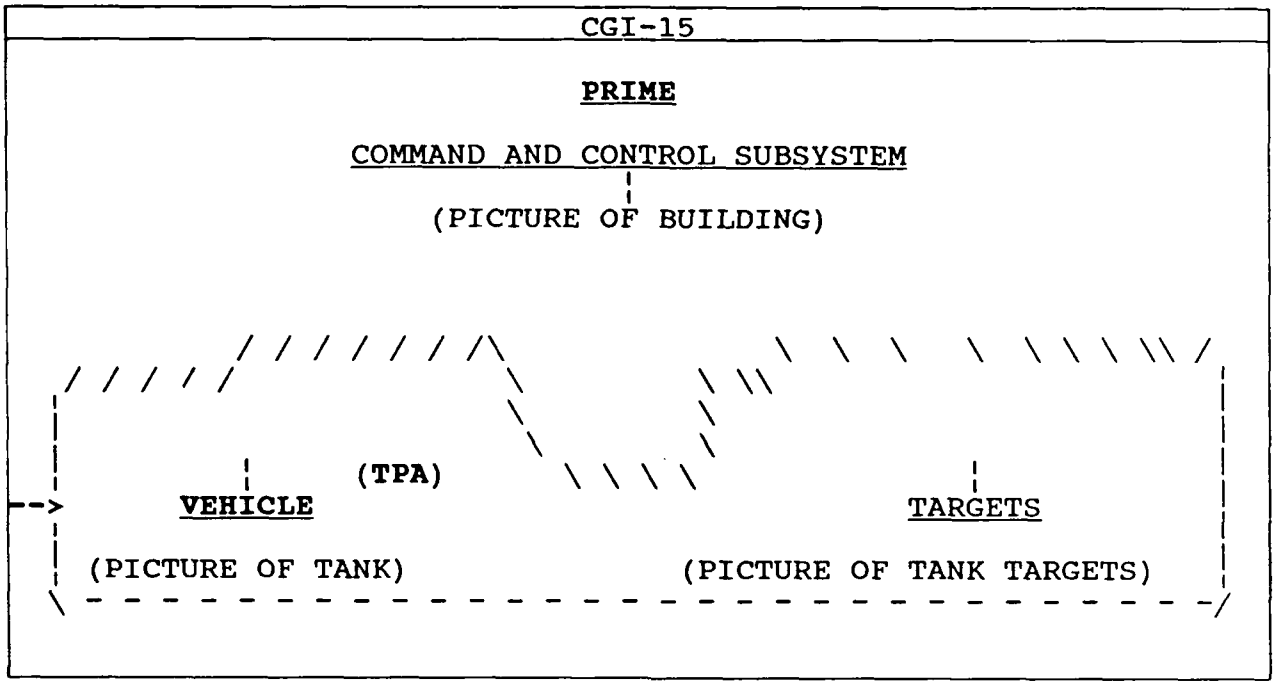
(HAVE ARROWS FROM BUILDING TO VEHICLE AND TARGET)

CGI-14

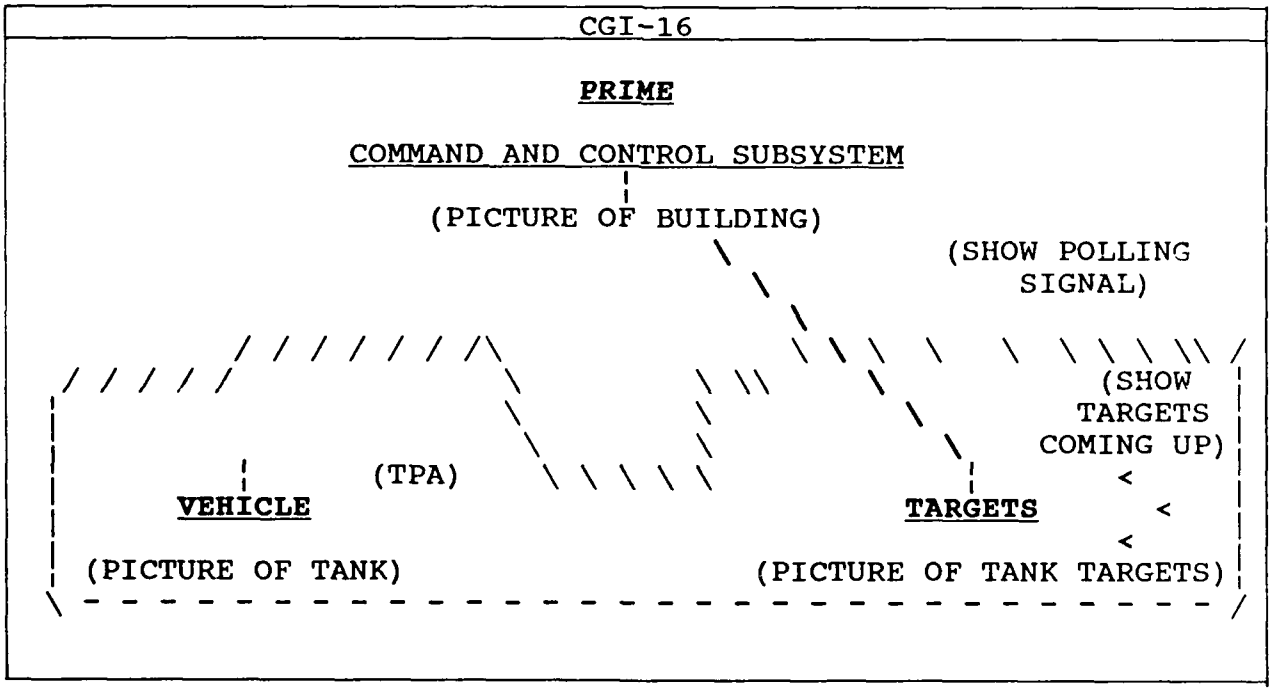


(HAVE ARROWS FROM VEHICLE AND TARGET TO BUILDING)

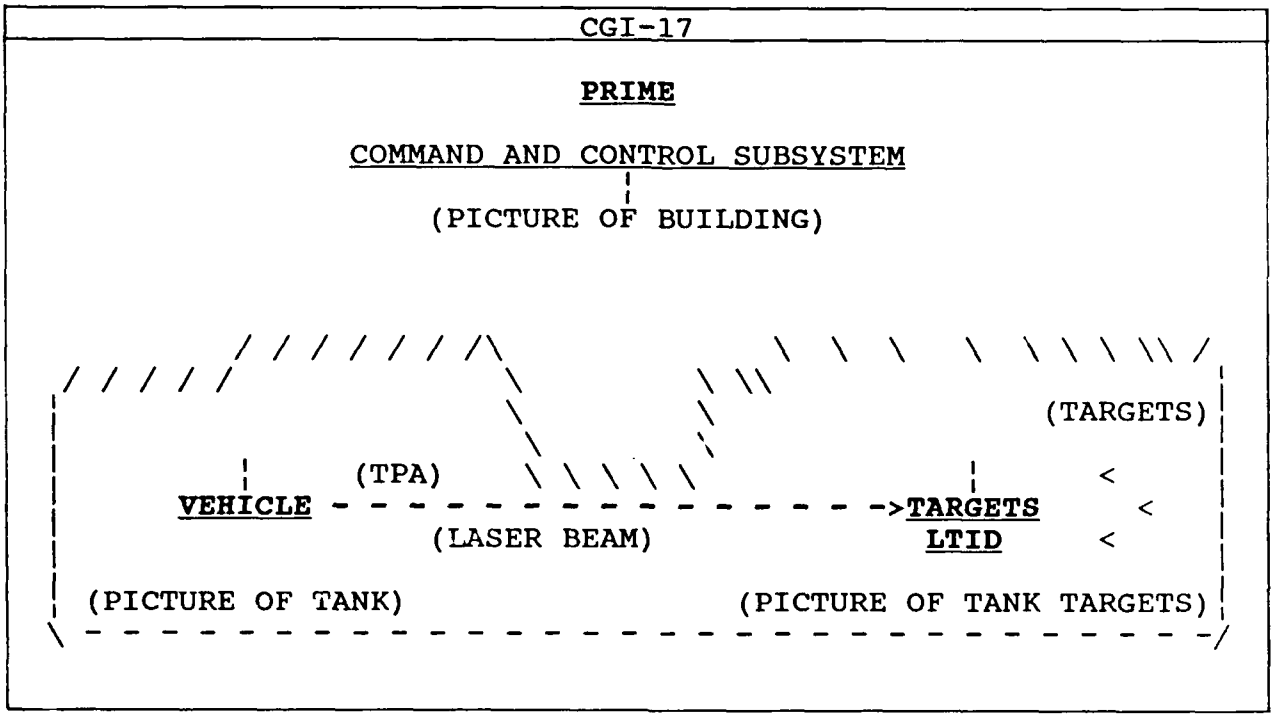
CGI-15


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TPA)
VEHICLE
TARGETS
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

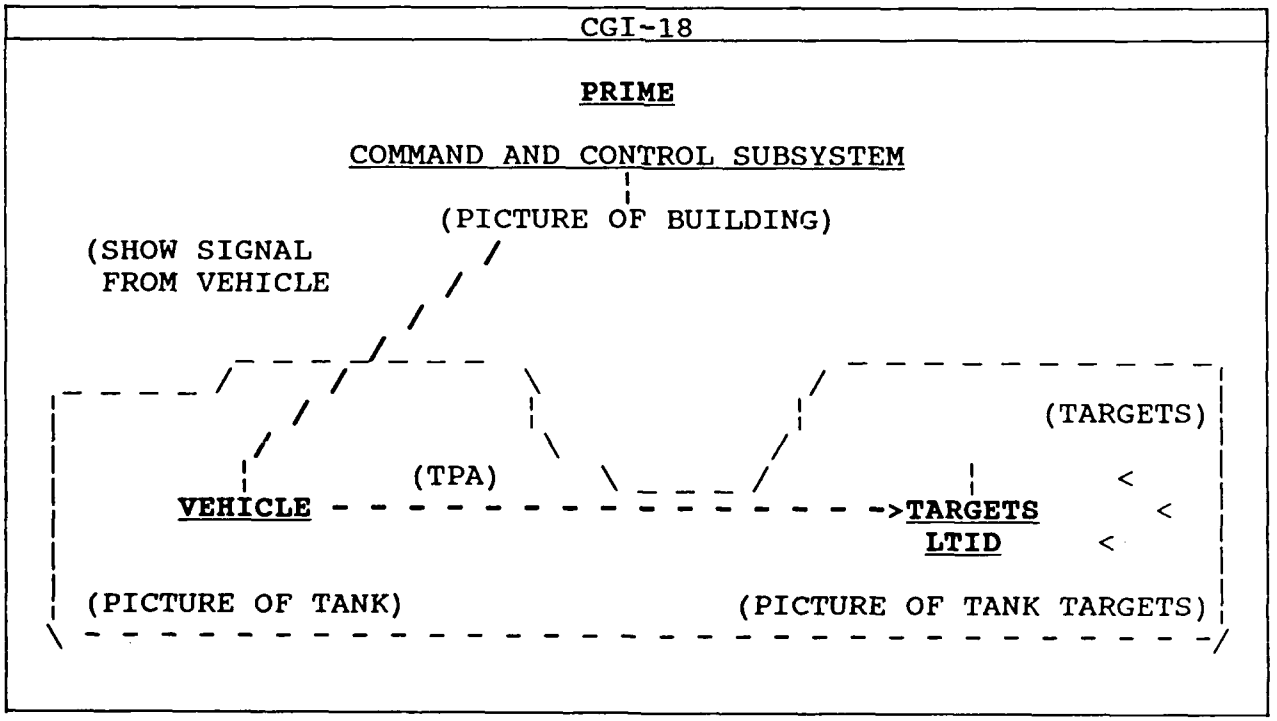
CGI-16


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW POLLING SIGNAL)
(SHOW TARGETS COMING UP)
(TPA)
VEHICLE
TARGETS
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

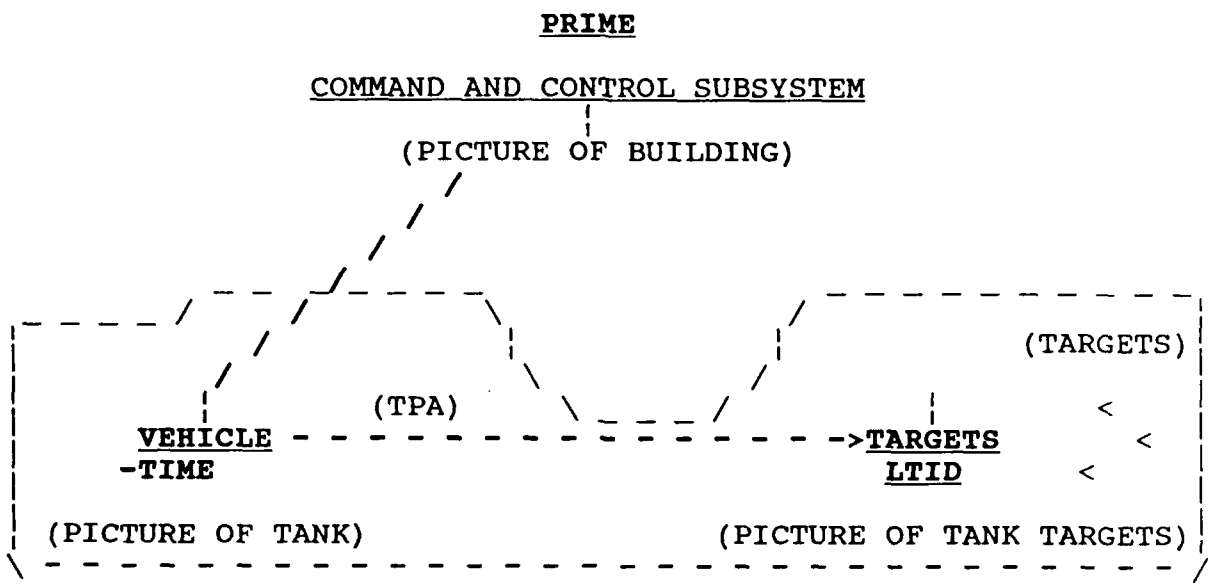
CGI-17


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TARGETS
LTID
(LASER BEAM)
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

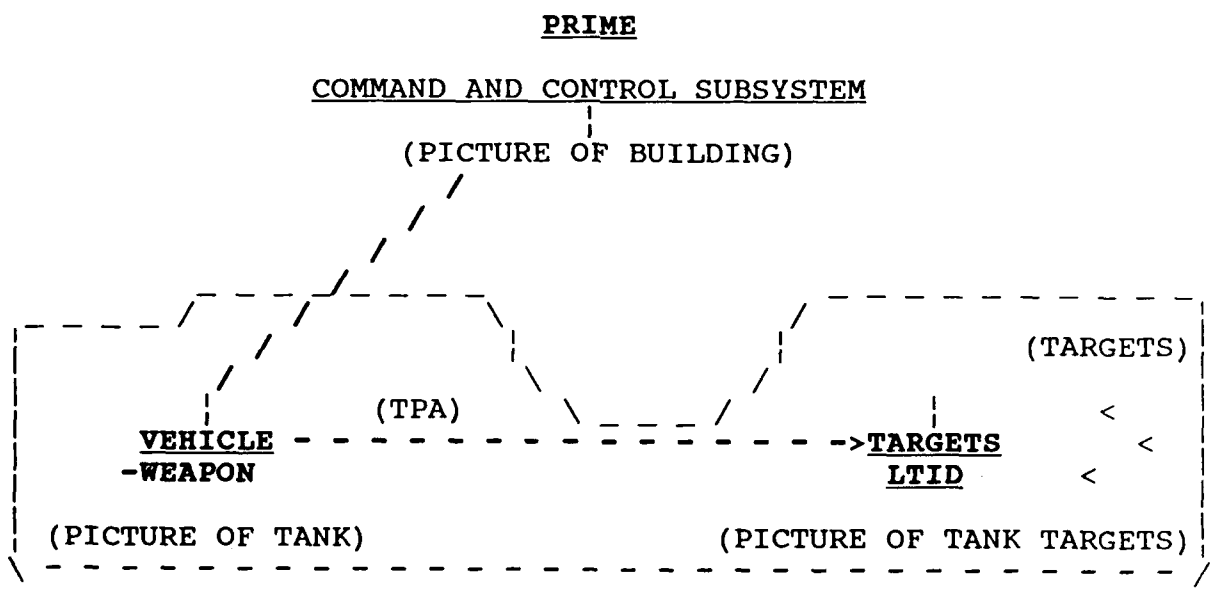
CGI-18

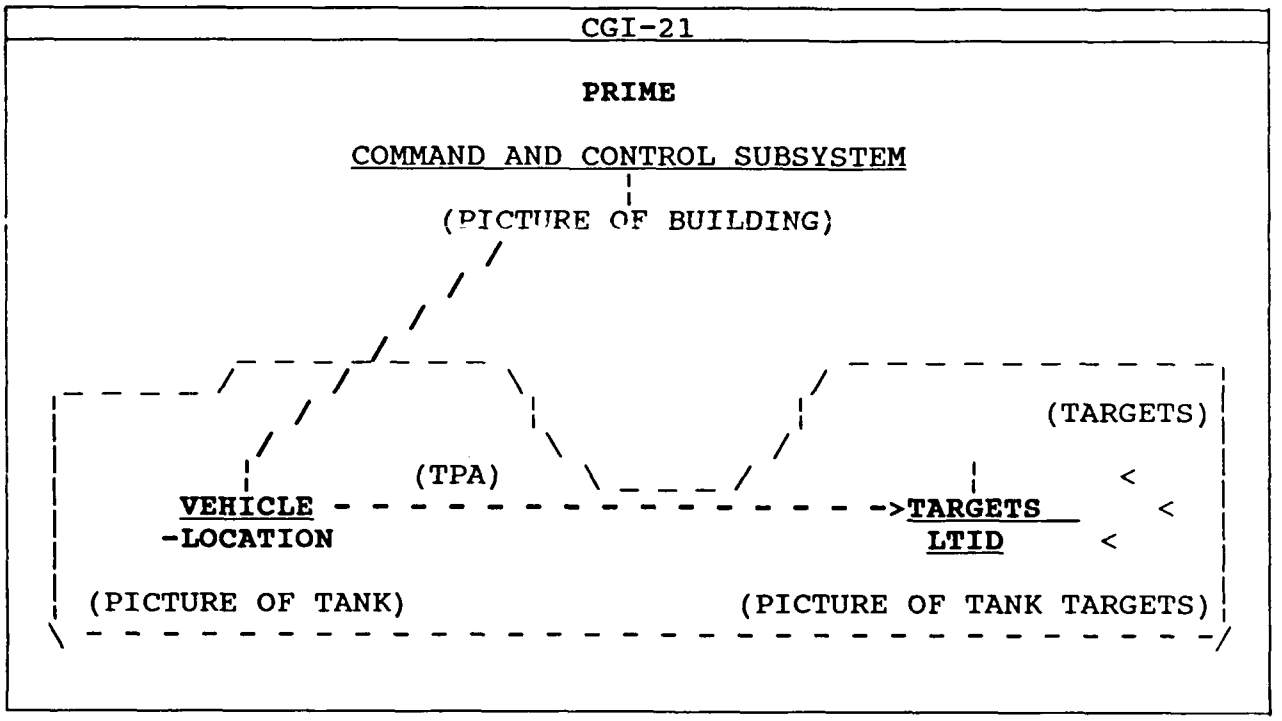

PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL
FROM VEHICLE
(TARGETS)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

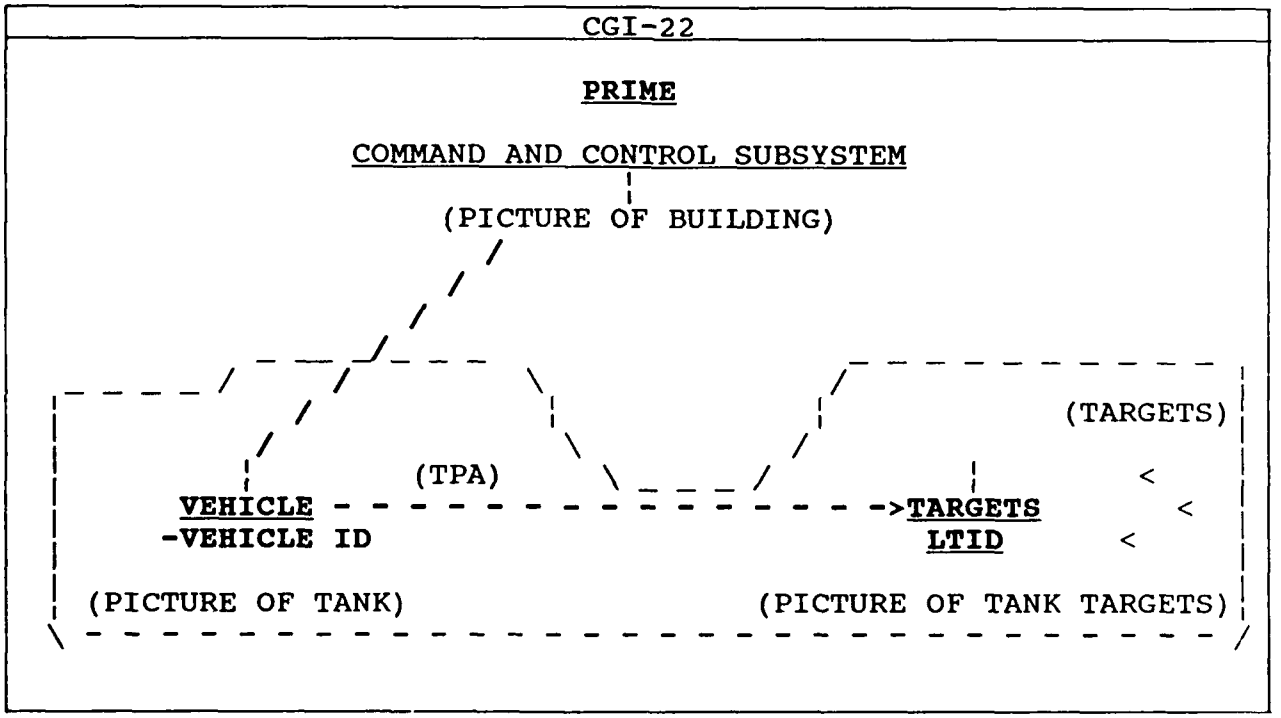
CGI-19


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TPA)
(TARGETS)
VEHICLE
-TIME
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

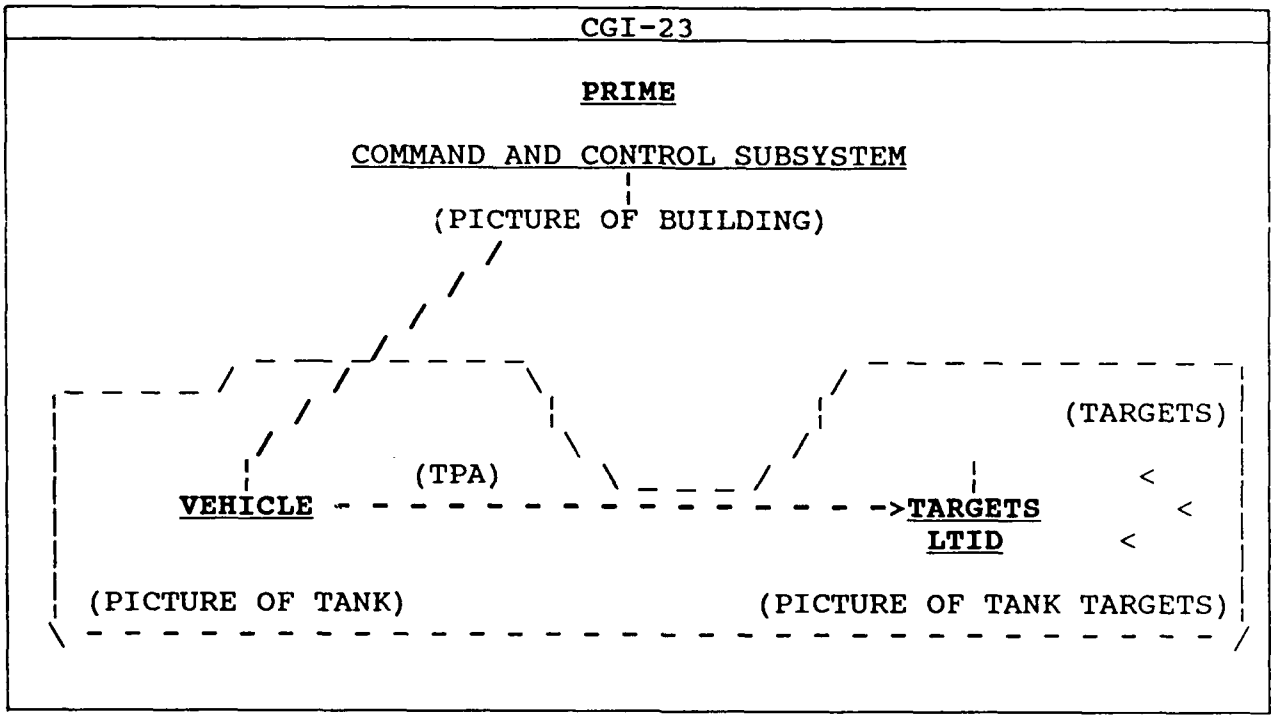
CGI-20


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TPA)
(TARGETS)
VEHICLE
-WEAPON
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

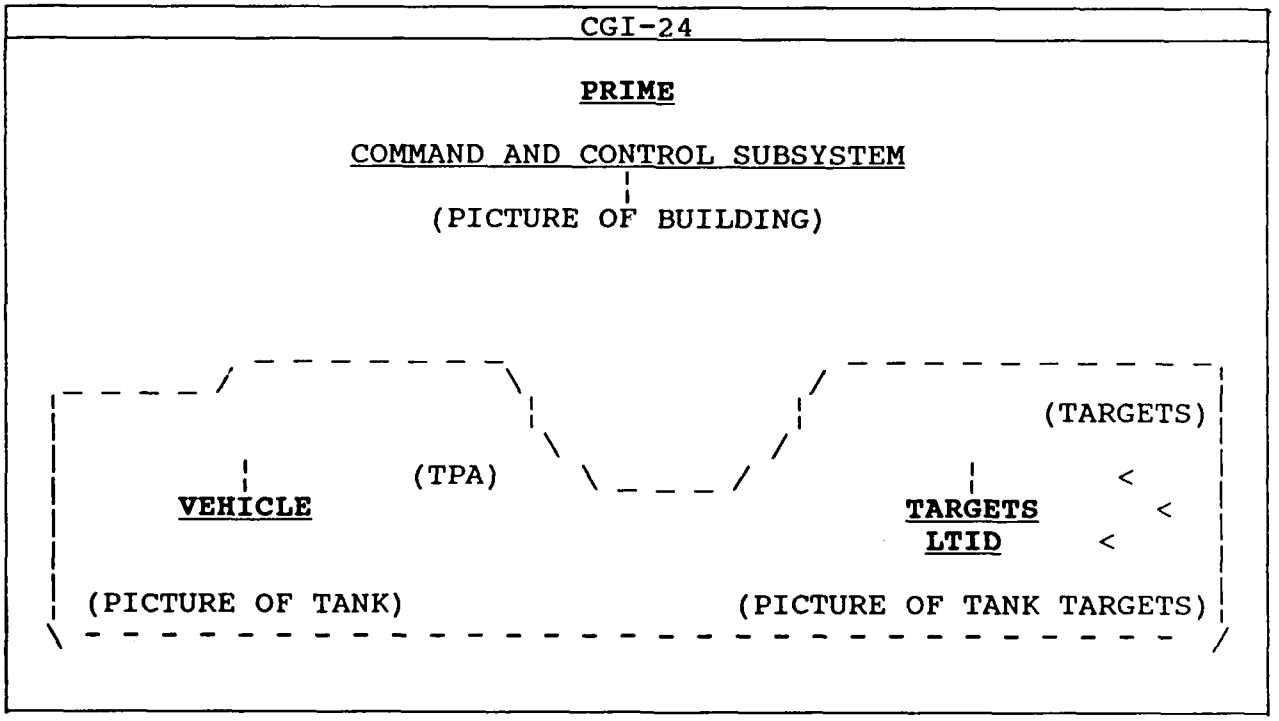

CGI-21
PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
-LOCATION
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)


CGI-22
PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
-VEHICLE ID
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

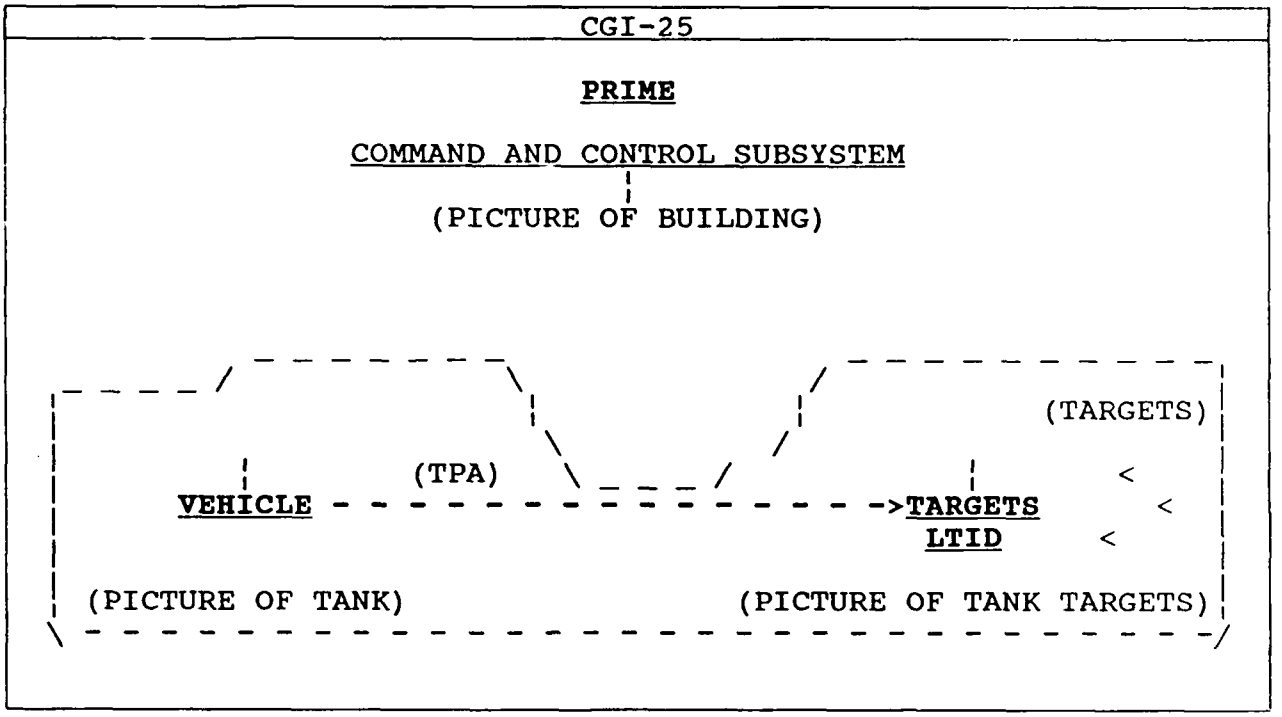
CGI-23


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

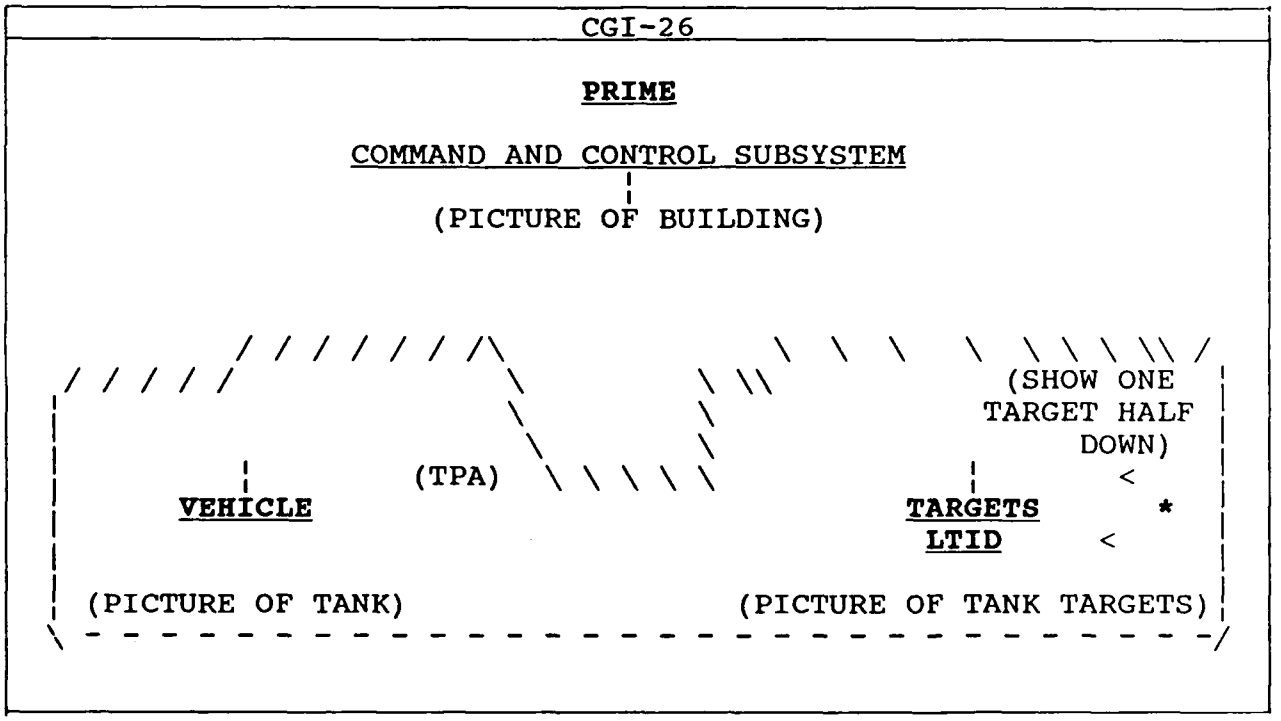
CGI-24


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

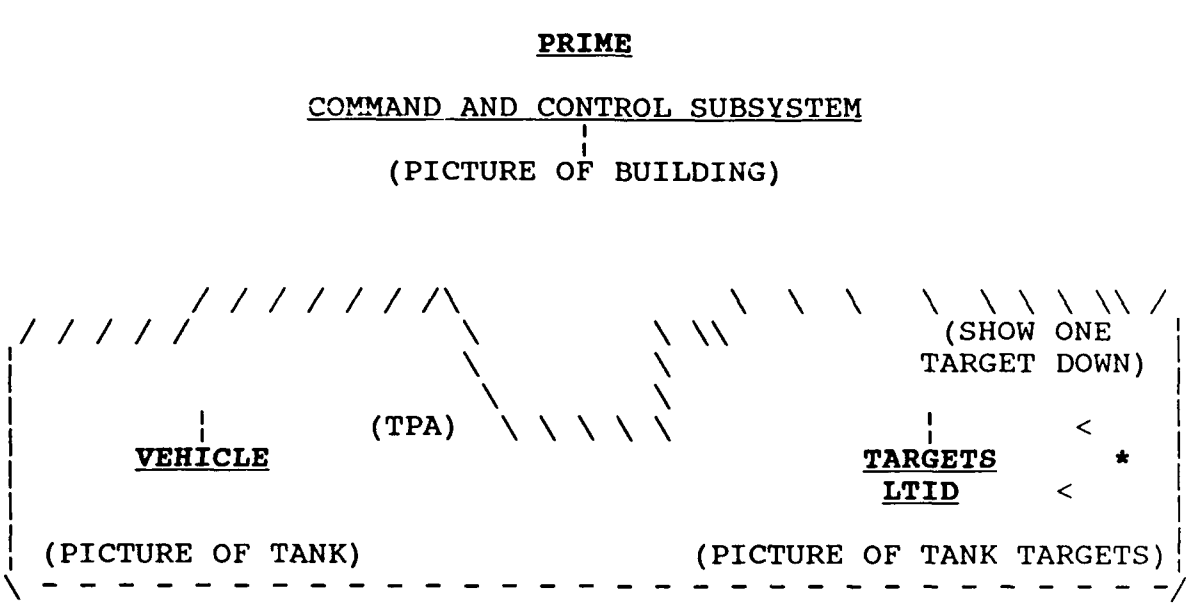
CGI-25


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

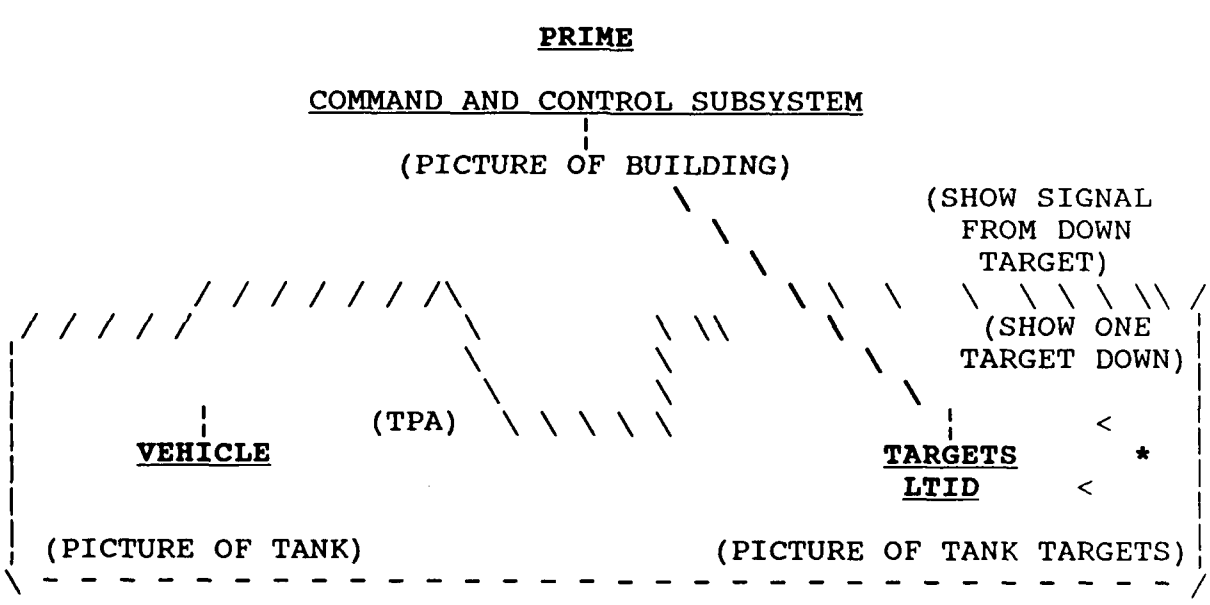
CGI-26


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW ONE TARGET HALF DOWN)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

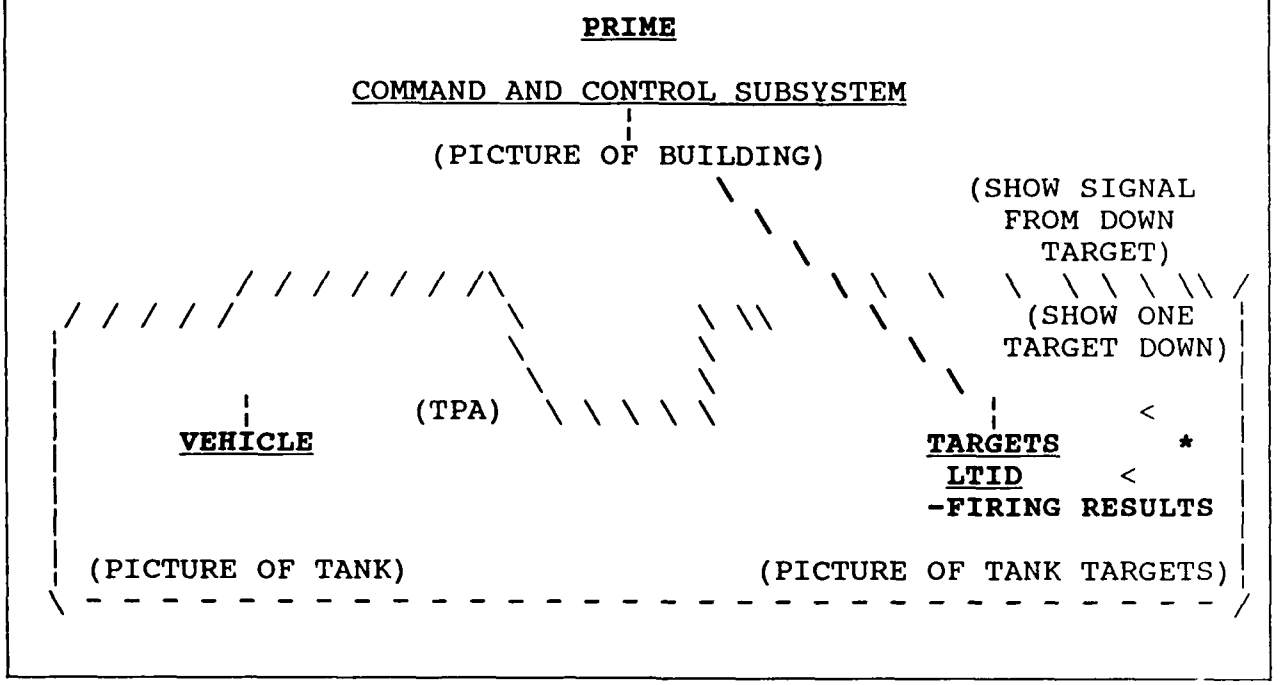
CGI-27


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

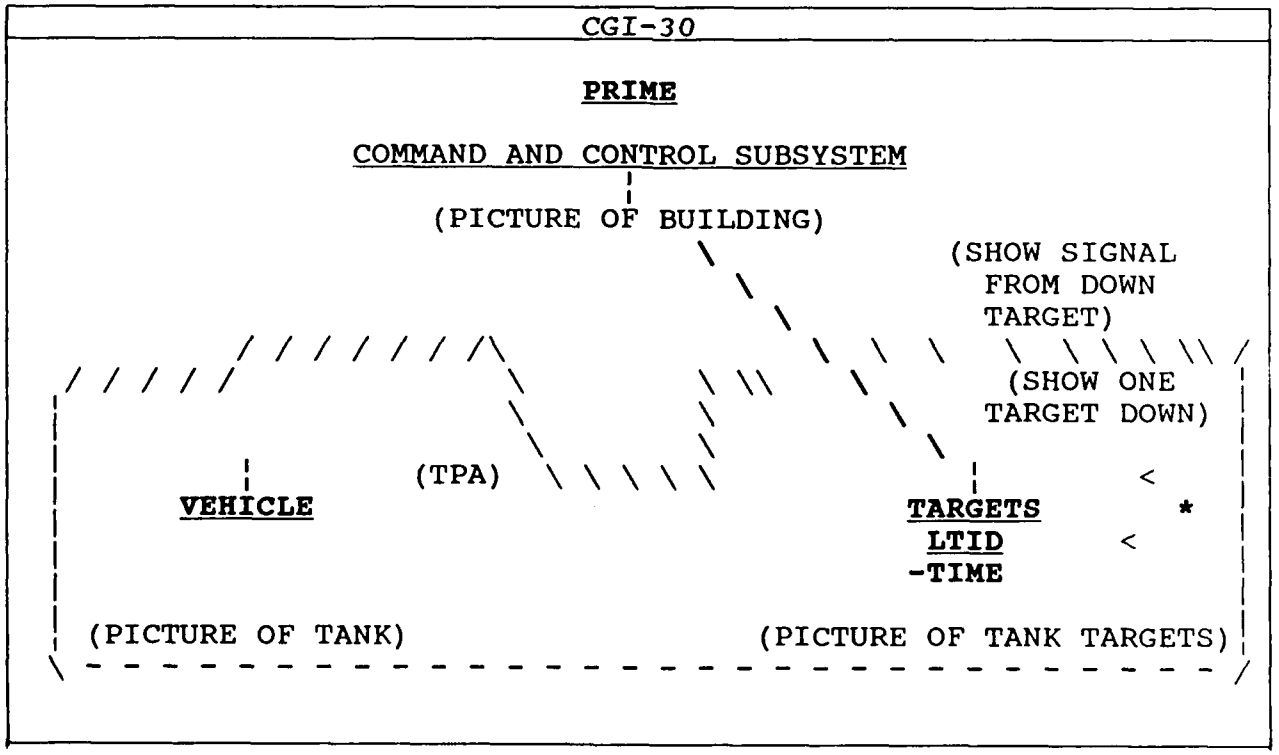
CGI-28


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL FROM DOWN TARGET)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

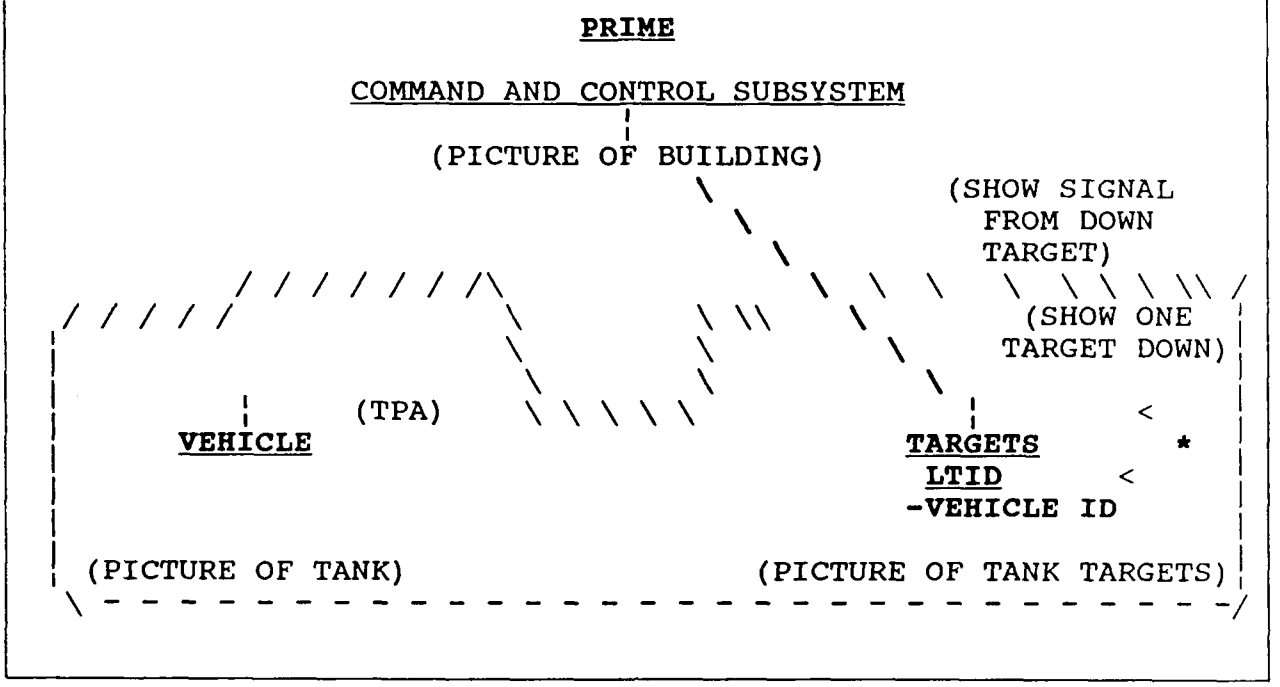
CGI-29


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL FROM DOWN TARGET)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
-FIRING RESULTS
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

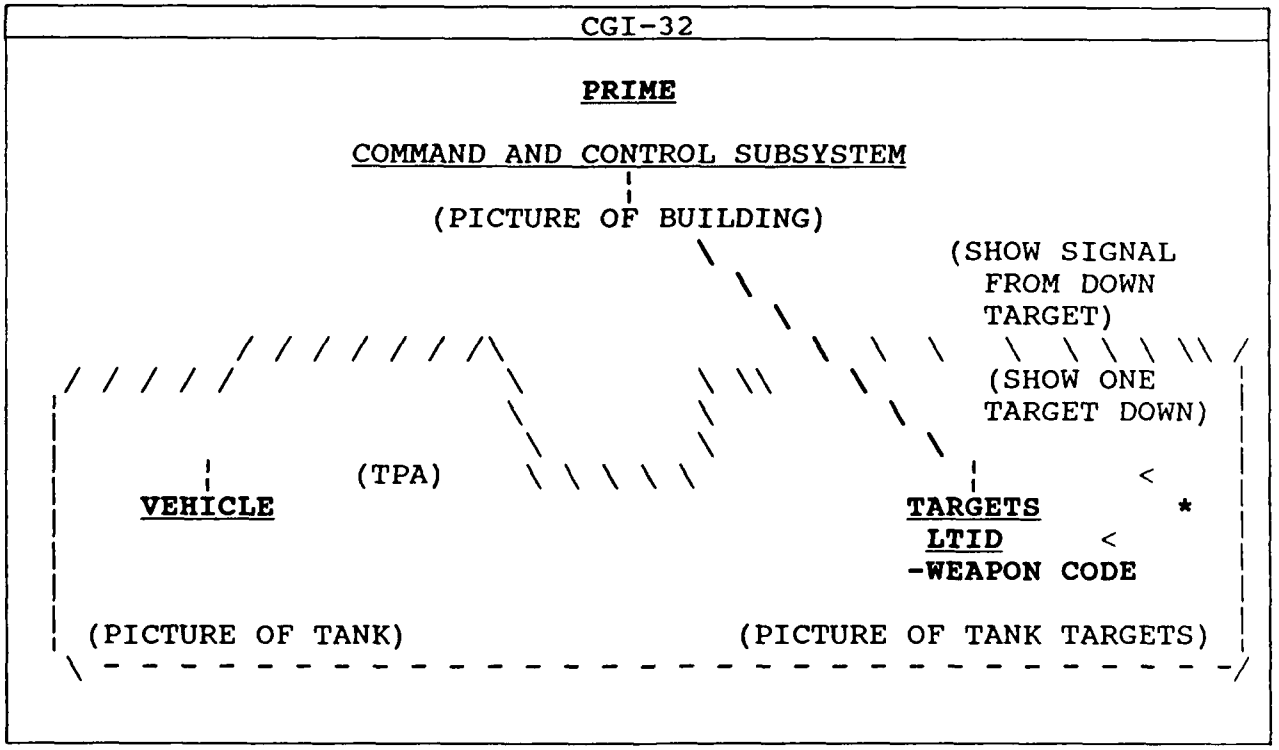
CGI-30


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL FROM DOWN TARGET)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
-TIME
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

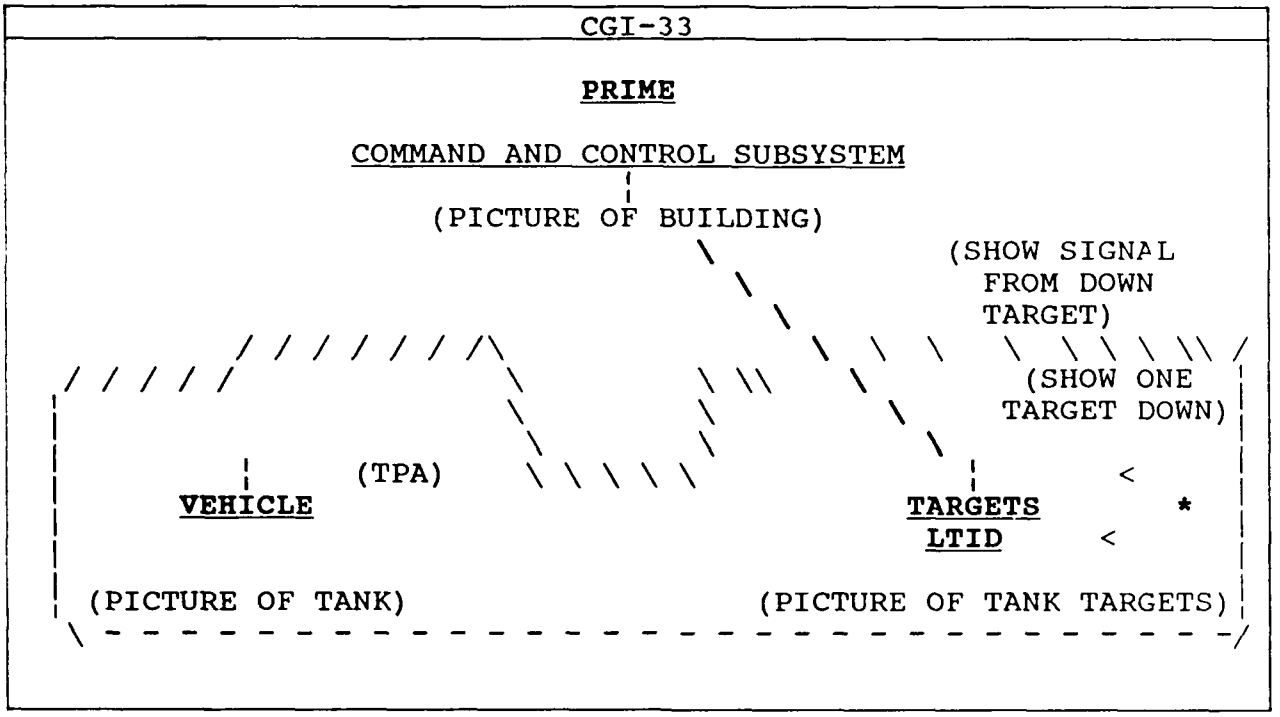
CGI-31


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL FROM DOWN TARGET)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
-VEHICLE ID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

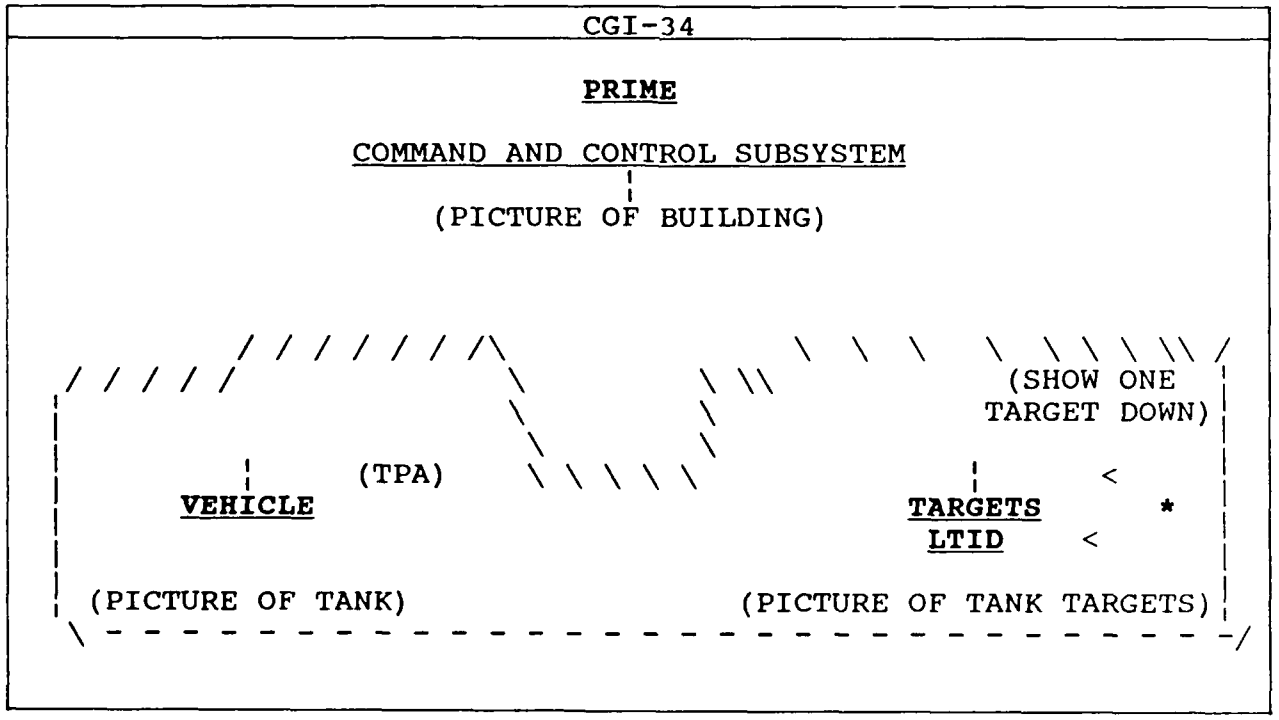
CGI-32


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL FROM DOWN TARGET)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
-WEAPON CODE
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

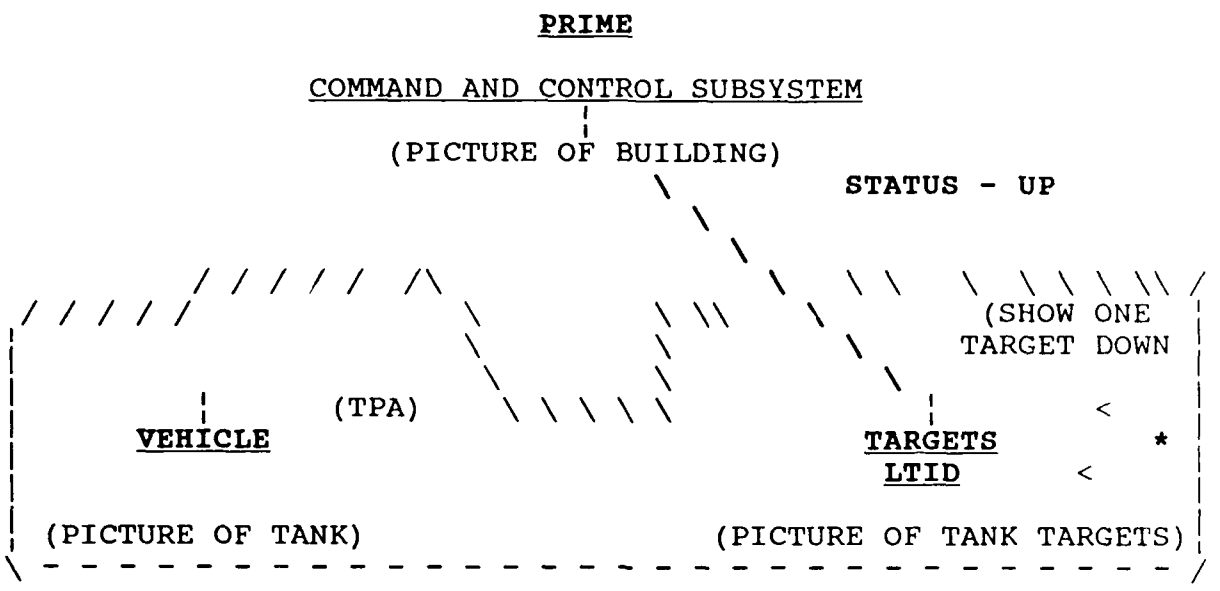
CGI-33


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL FROM DOWN TARGET)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

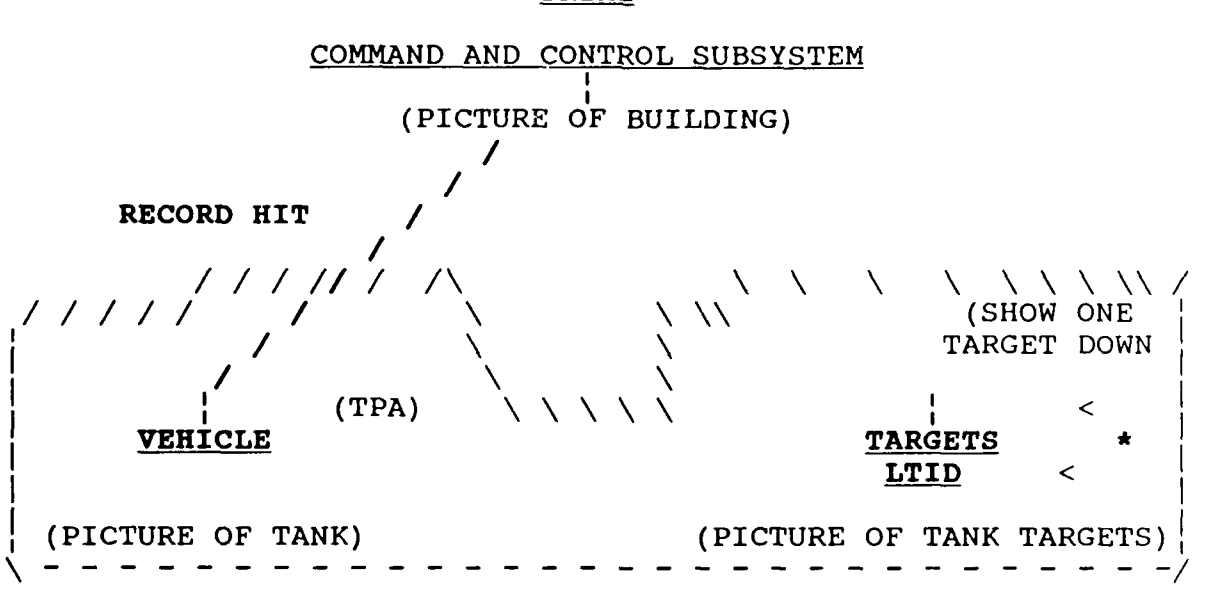
CGI-34


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW ONE TARGET DOWN)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

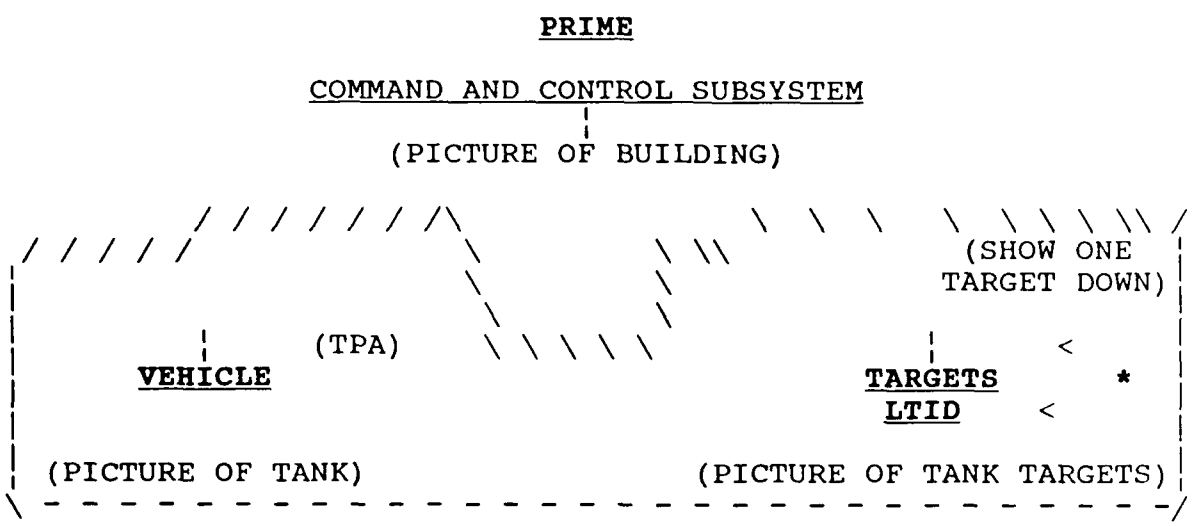
CGI-35


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
STATUS - UP
(SHOW ONE
TARGET DOWN
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

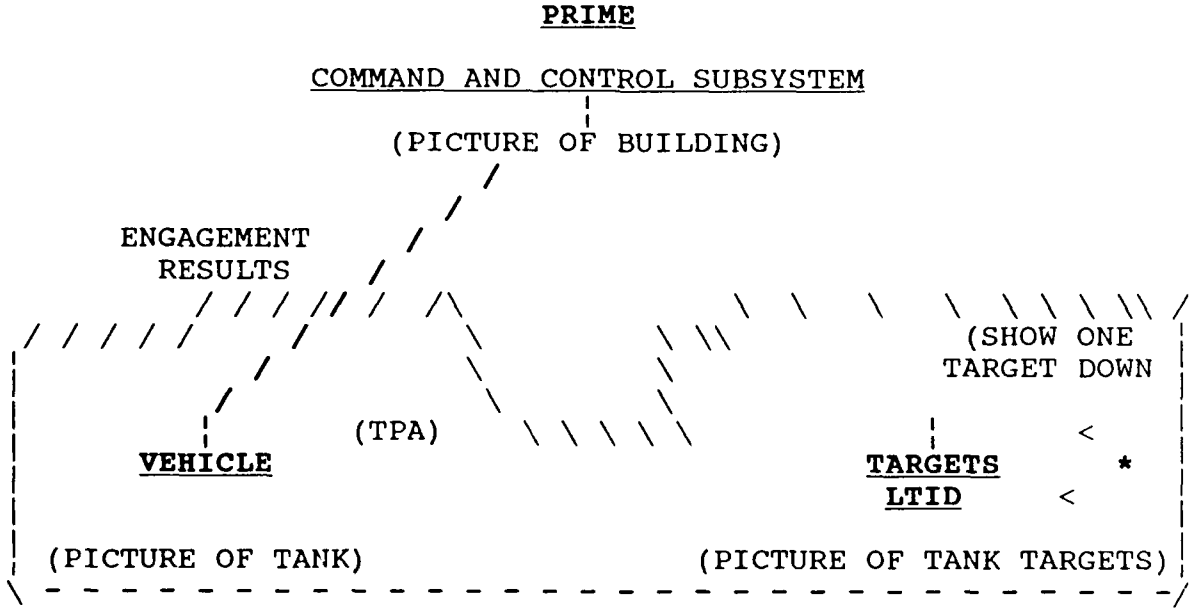
CGI-36


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
RECORD HIT
(SHOW ONE
TARGET DOWN
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

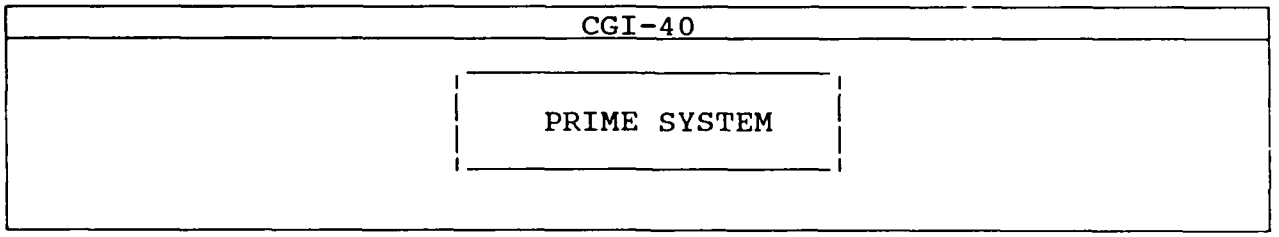
CGI-37

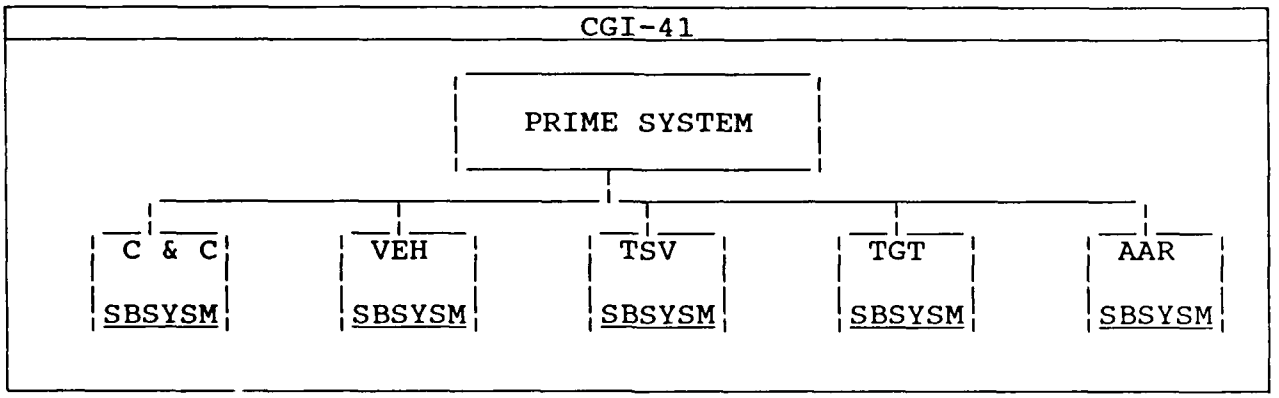


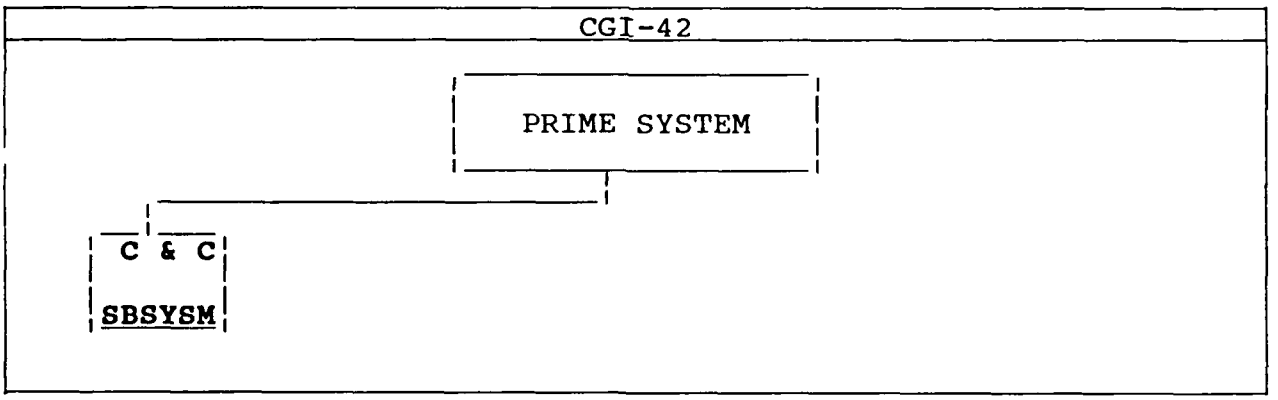
CGI-38

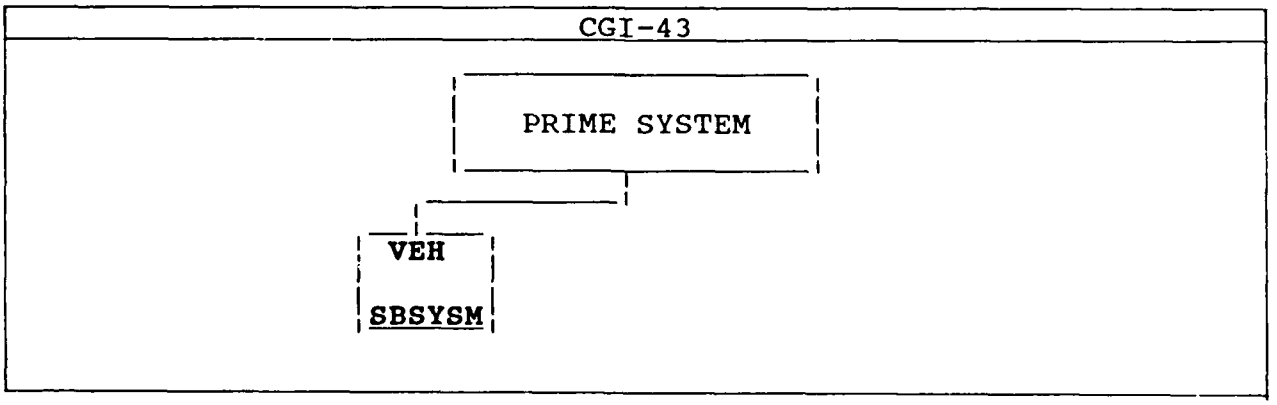


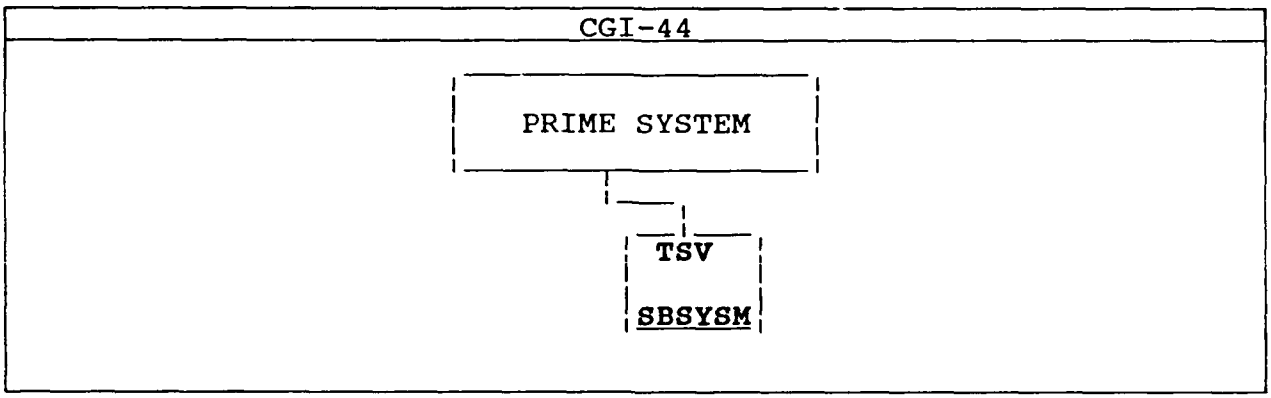
CGI-39

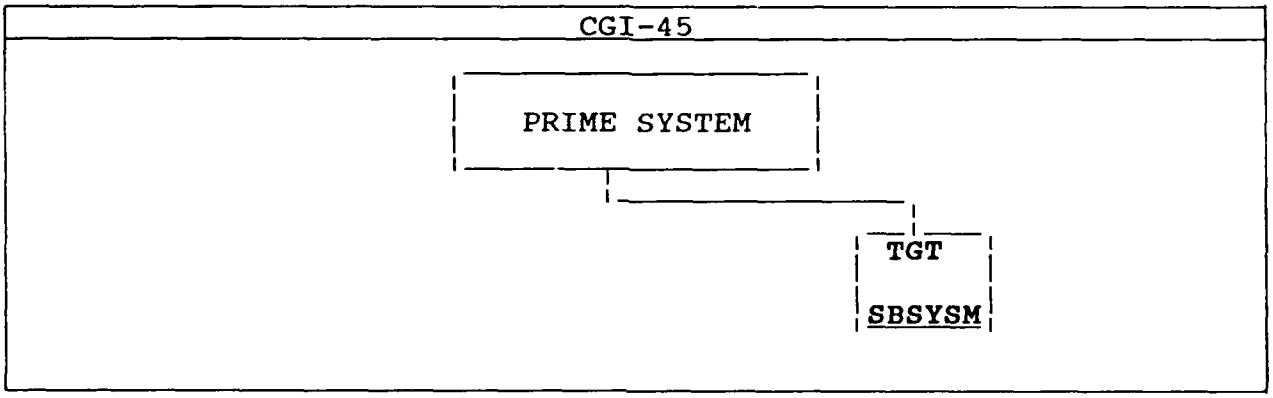

CGI-40
PRIME SYSTEM

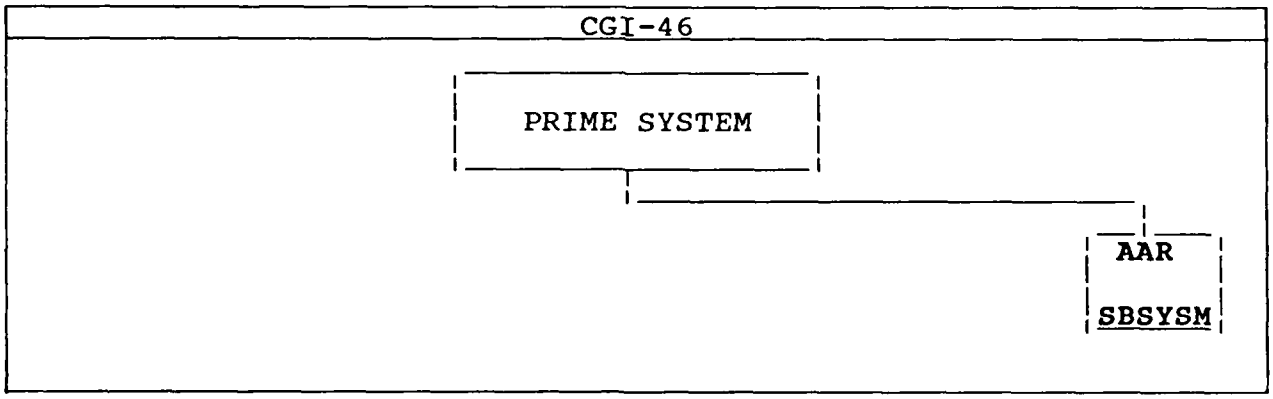

CGI-41
PRIME SYSTEM
C & C
SBSYSM
VEH
SBSYSM
TSV
SBSYSM
TGT
SBSYSM
AAR
SBSYSM

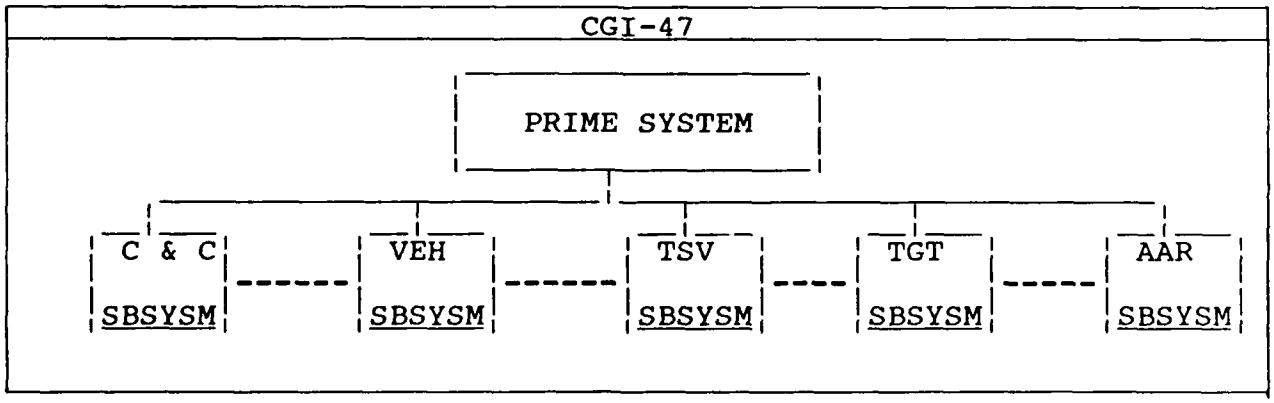

CGI-42
PRIME SYSTEM
C & C
SBSYSM


CGI-43
PRIME SYSTEM
VEH
SBSYSM

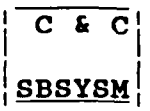

CGI-44
PRIME SYSTEM
TSV
SBSYSM


CGI-45
PRIME SYSTEM
TGT
SBSYSM

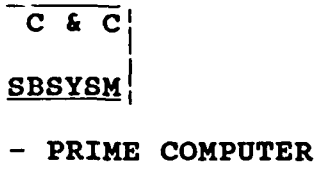

CGI-46
PRIME SYSTEM
AAR
SBSYSM


CGI-47
PRIME SYSTEM
C & C
SBSYSM
VEH
SBSYSM
TSV
SBSYSM
TGT
SBSYSM
AAR
SBSYSM

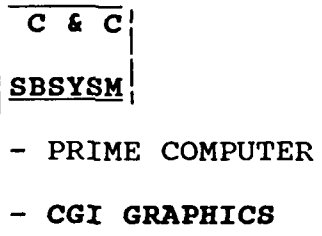
CGI-48



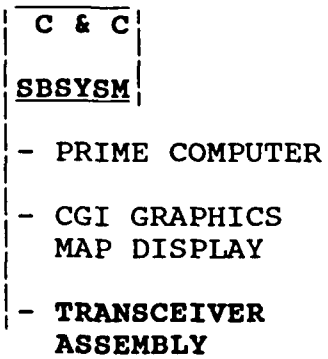
CGI-49



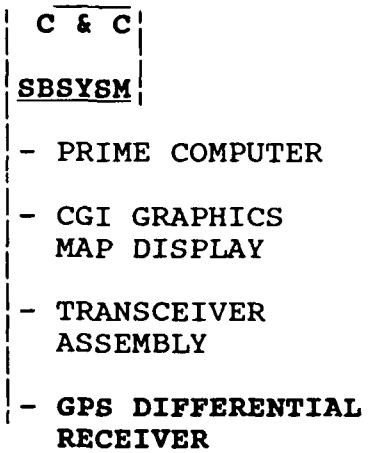
CGI-50



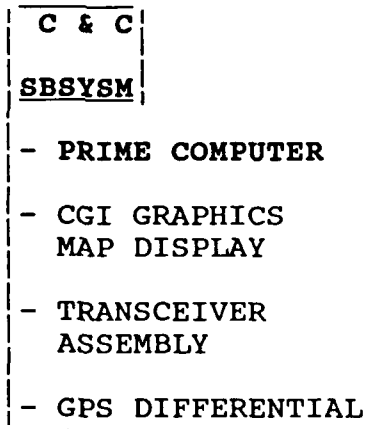
CGI-51



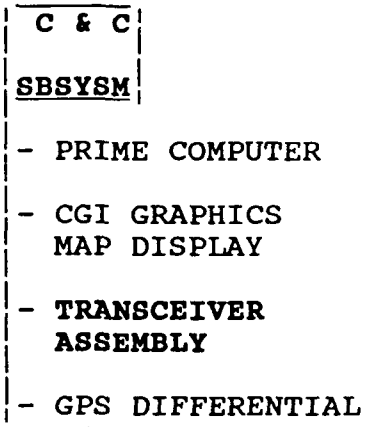
CGI-52


C & C
SBSYSM
- PRIME COMPUTER
- CGI GRAPHICS MAP DISPLAY
- TRANSCEIVER ASSEMBLY
- GPS DIFFERENTIAL RECEIVER

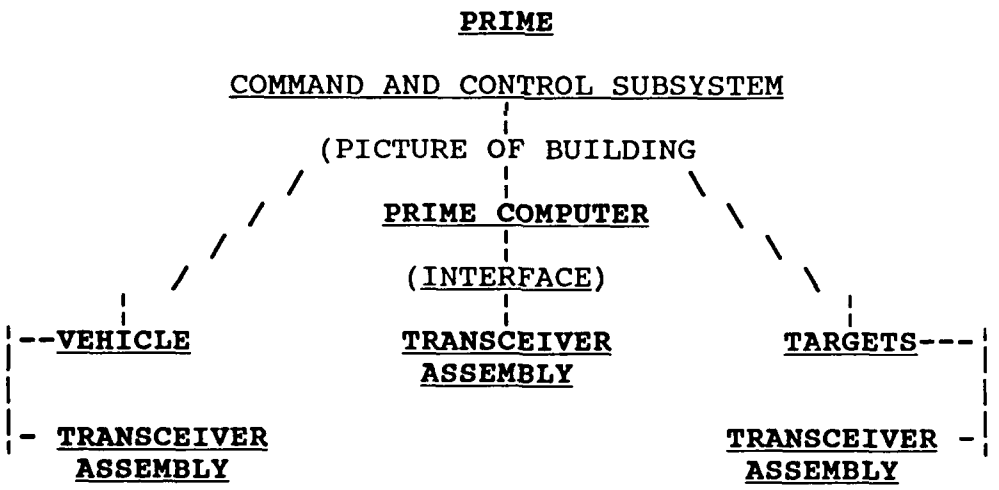
CGI-53


C & C
SBSYSM
- PRIME COMPUTER
- CGI GRAPHICS MAP DISPLAY
- TRANSCEIVER ASSEMBLY
- GPS DIFFERENTIAL RECEIVER

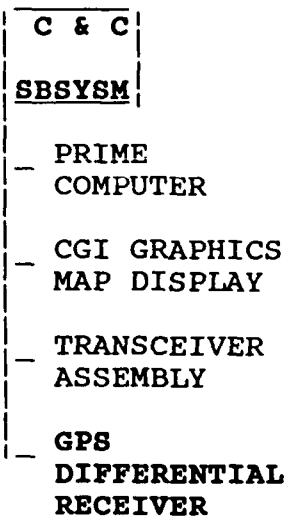
CGI-54


C & C
SBSYSM
- PRIME COMPUTER
- CGI GRAPHICS MAP DISPLAY
- TRANSCEIVER ASSEMBLY
- GPS DIFFERENTIAL RECEIVER

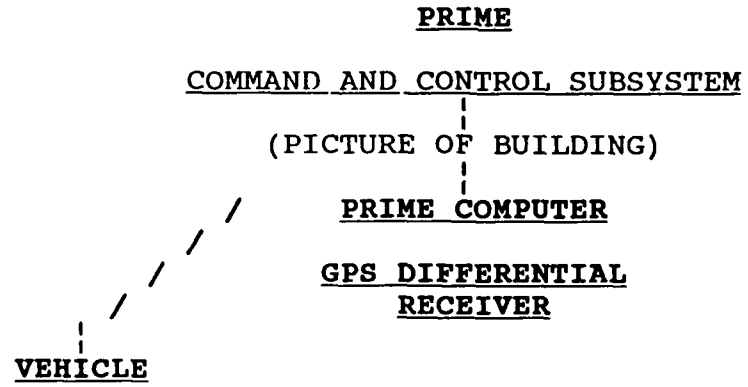
CGI-55


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING
PRIME COMPUTER
(INTERFACE)
--VEHICLE
TRANSCEIVER ASSEMBLY
TARGETS---
- TRANSCEIVER ASSEMBLY
TRANSCEIVER - ASSEMBLY

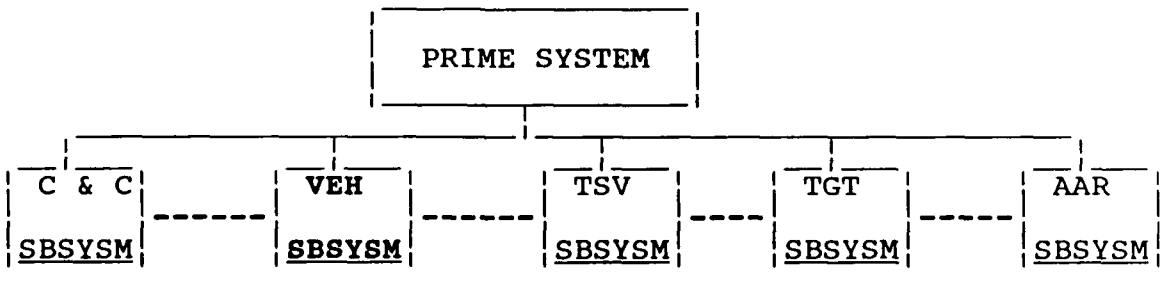
CGI-56



CGI-57

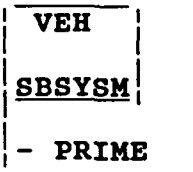


CGI-58

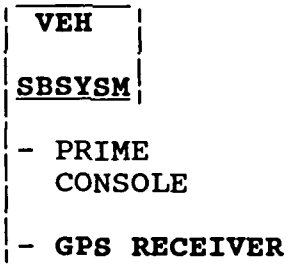


CGI-59

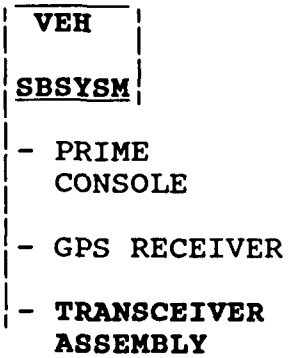
CGI-60



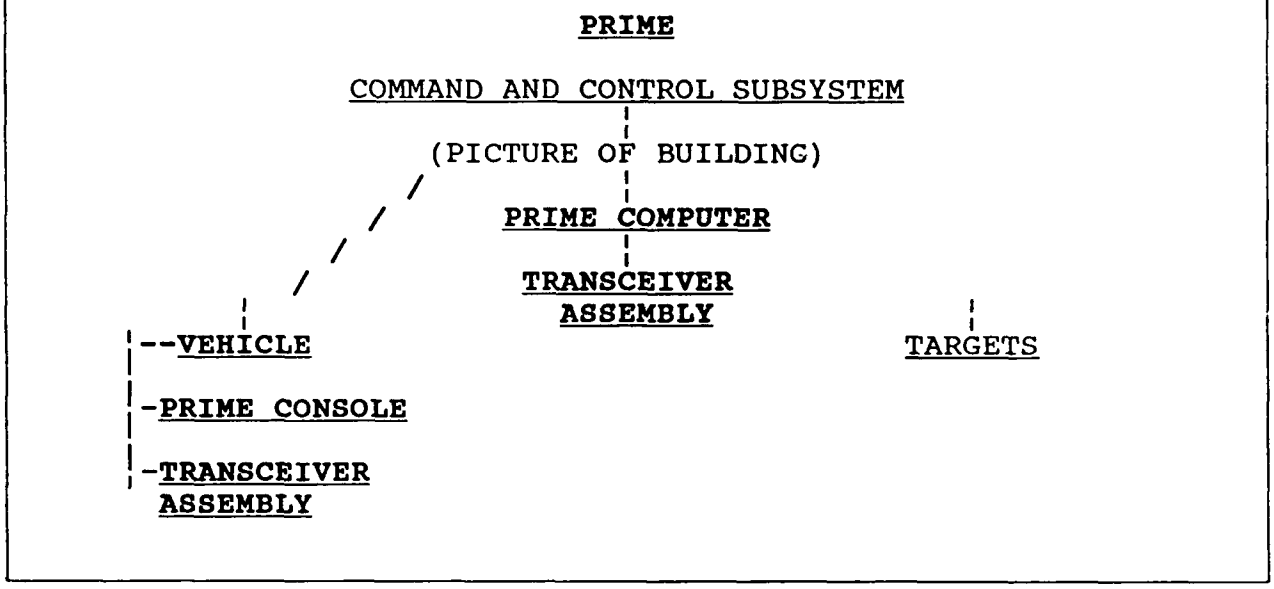
CGI-61



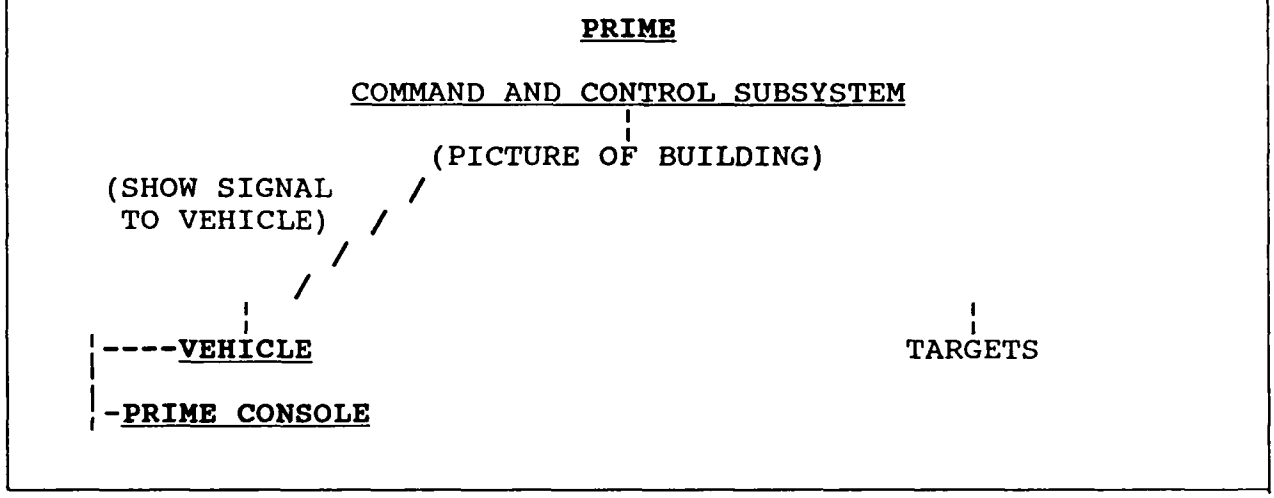
CGI-62



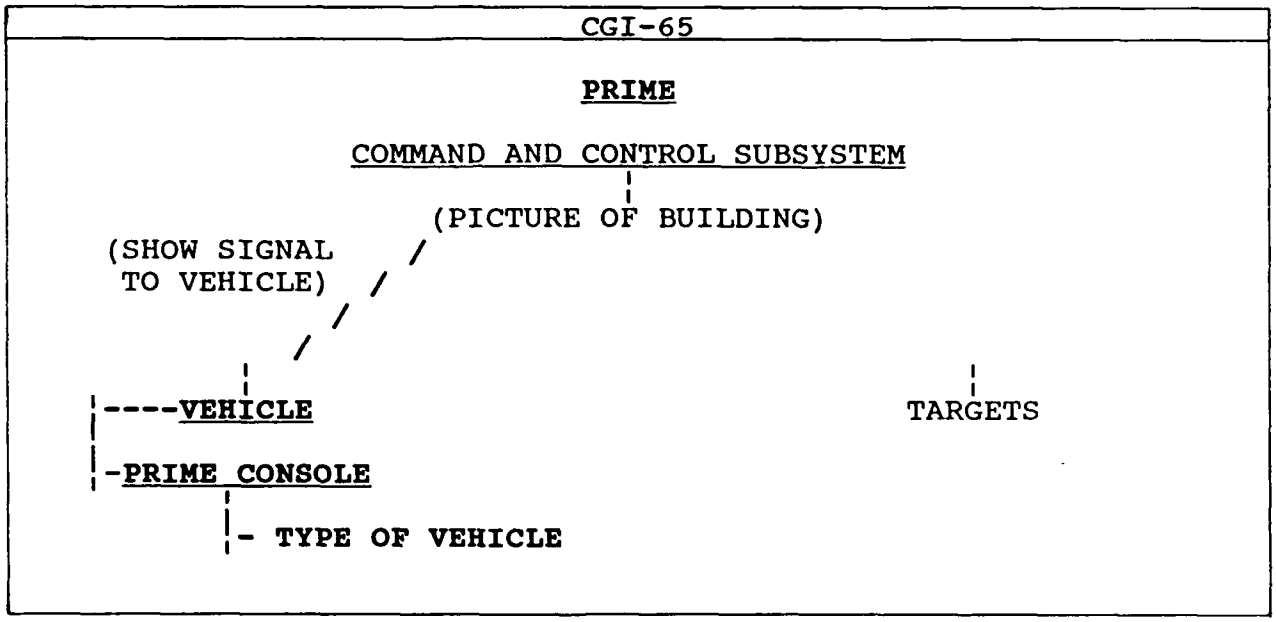
CGI-63


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
PRIME COMPUTER
TRANSCEIVER ASSEMBLY
--VEHICLE
-PRIME CONSOLE
-TRANSCEIVER ASSEMBLY
TARGETS

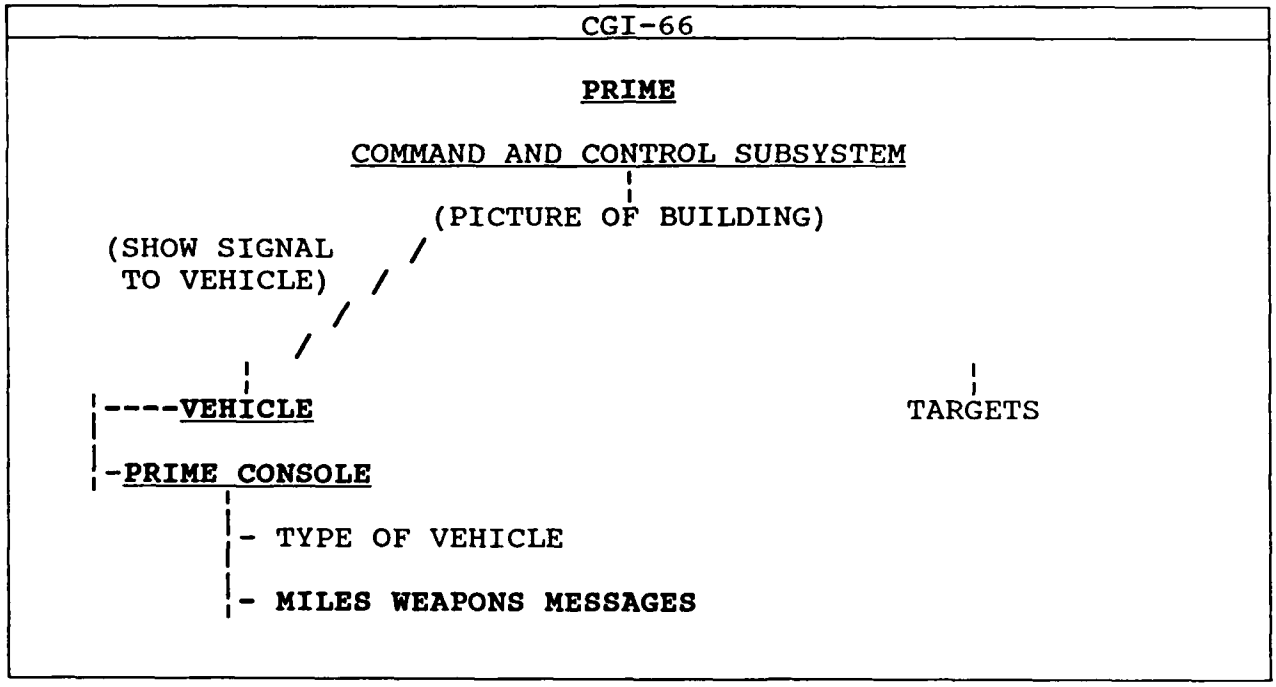
CGI-64


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO VEHICLE)
----VEHICLE
-PRIME CONSOLE
TARGETS

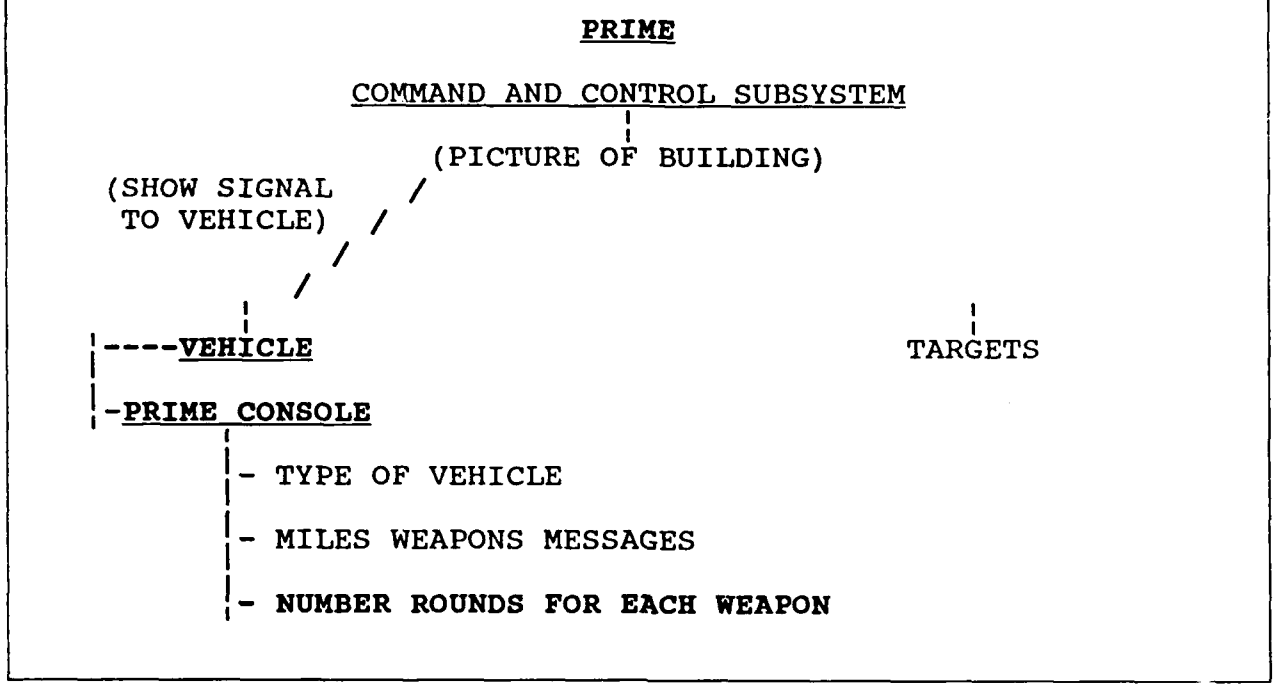
CGI-65


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO VEHICLE)
VEHICLE
TARGETS
PRIME CONSOLE
- TYPE OF VEHICLE

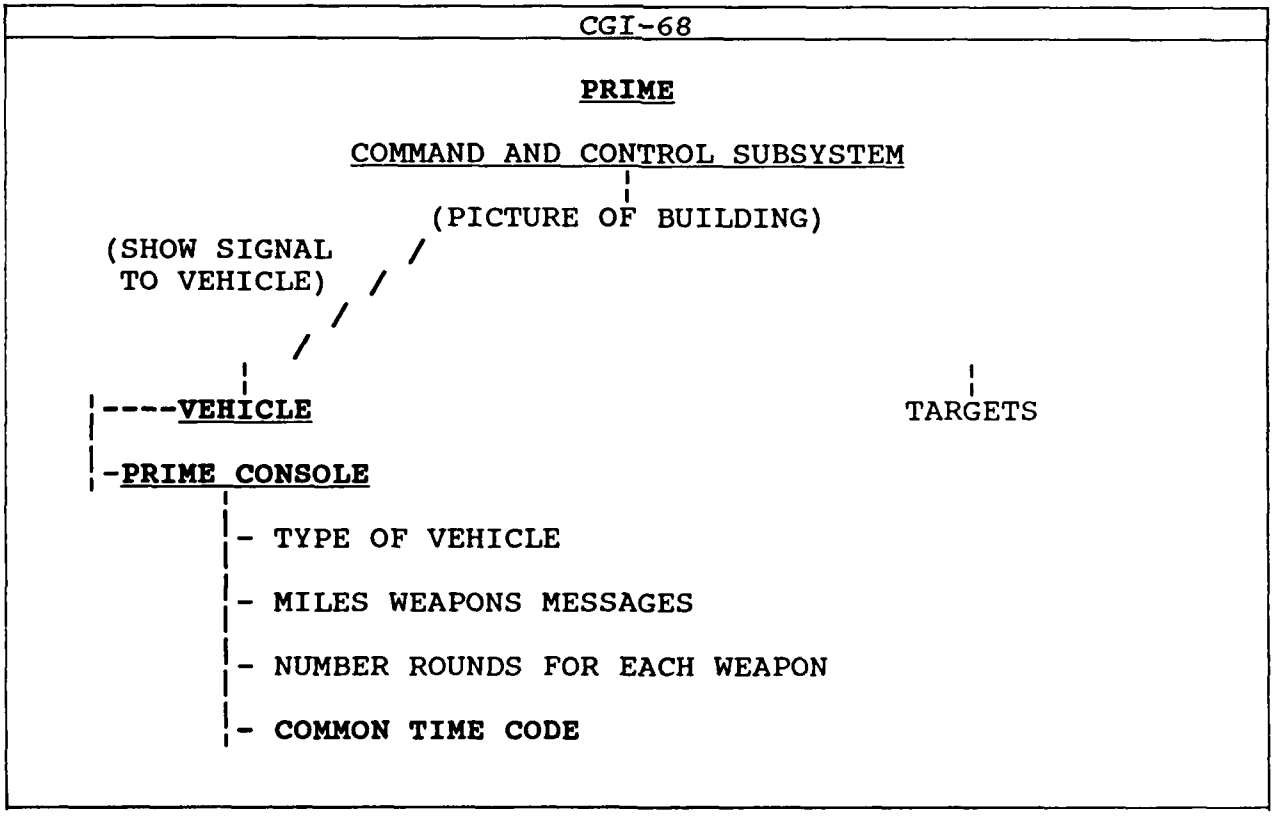
CGI-66


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO VEHICLE)
VEHICLE
TARGETS
PRIME CONSOLE
- TYPE OF VEHICLE
- MILES WEAPONS MESSAGES

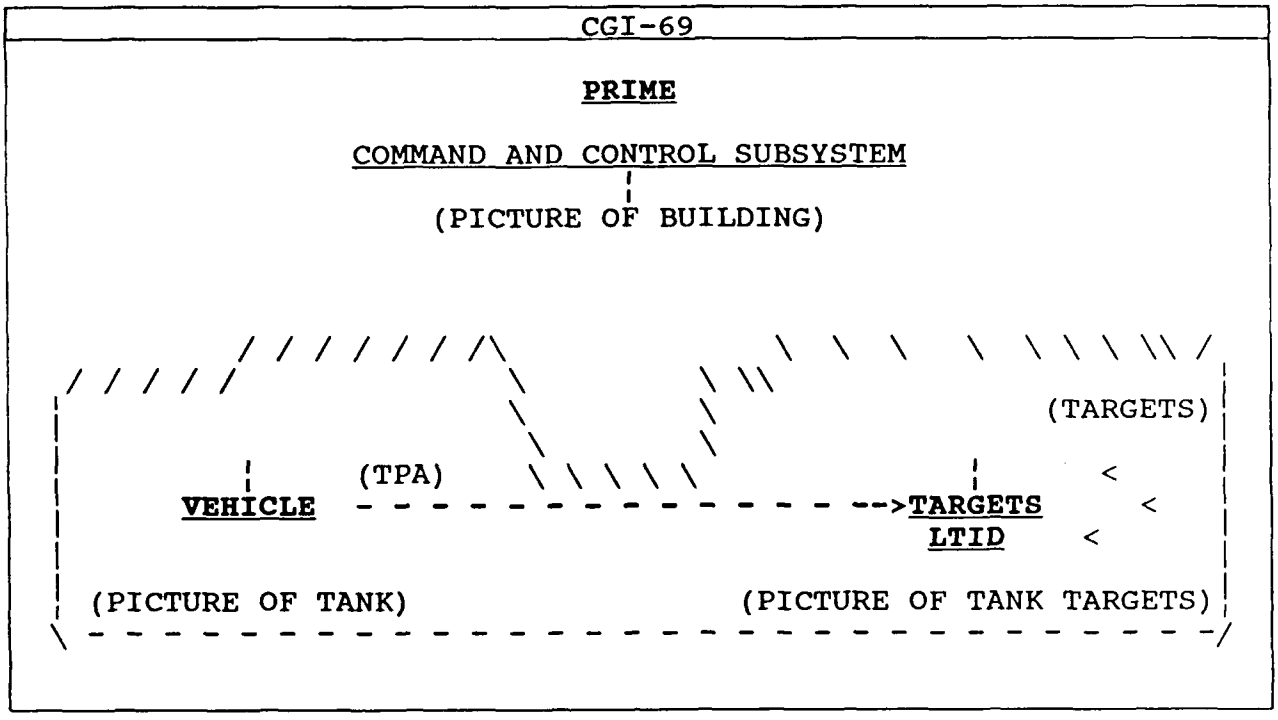
CGI-67


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO VEHICLE)
VEHICLE
TARGETS
PRIME CONSOLE
- TYPE OF VEHICLE
- MILES WEAPONS MESSAGES
- NUMBER ROUNDS FOR EACH WEAPON

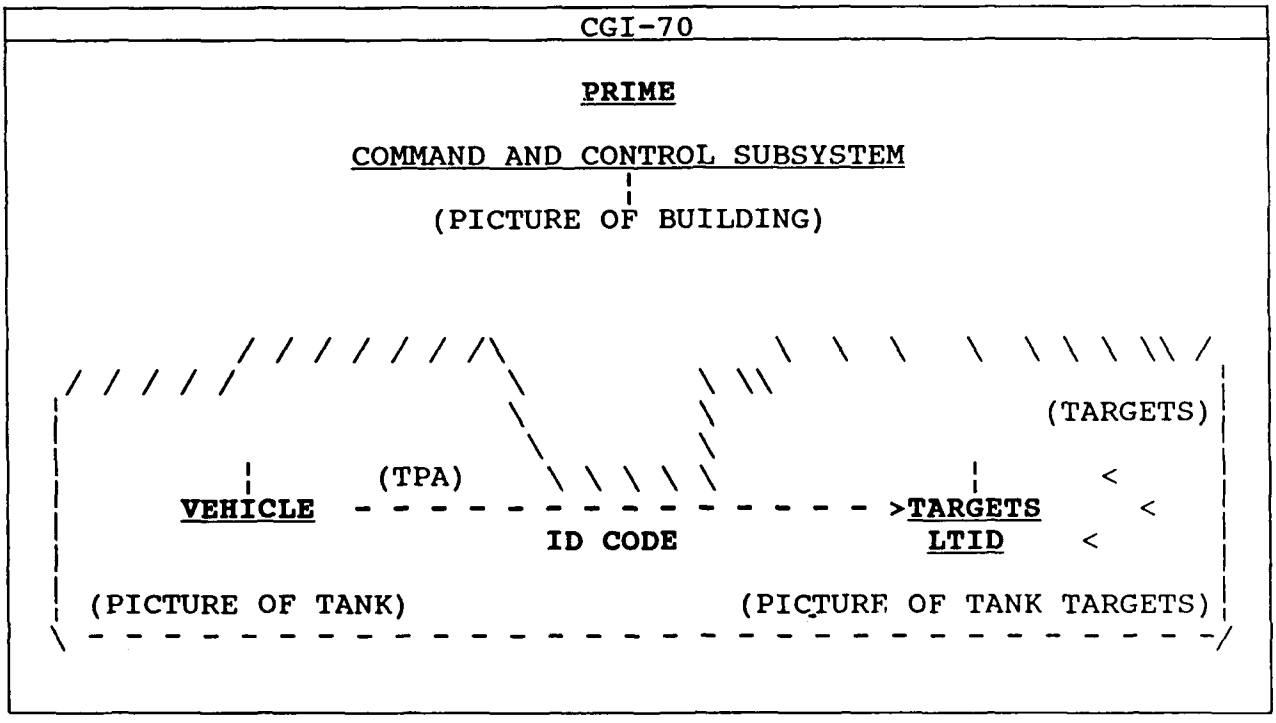
CGI-68


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO VEHICLE)
VEHICLE
TARGETS
PRIME CONSOLE
- TYPE OF VEHICLE
- MILES WEAPONS MESSAGES
- NUMBER ROUNDS FOR EACH WEAPON
- COMMON TIME CODE

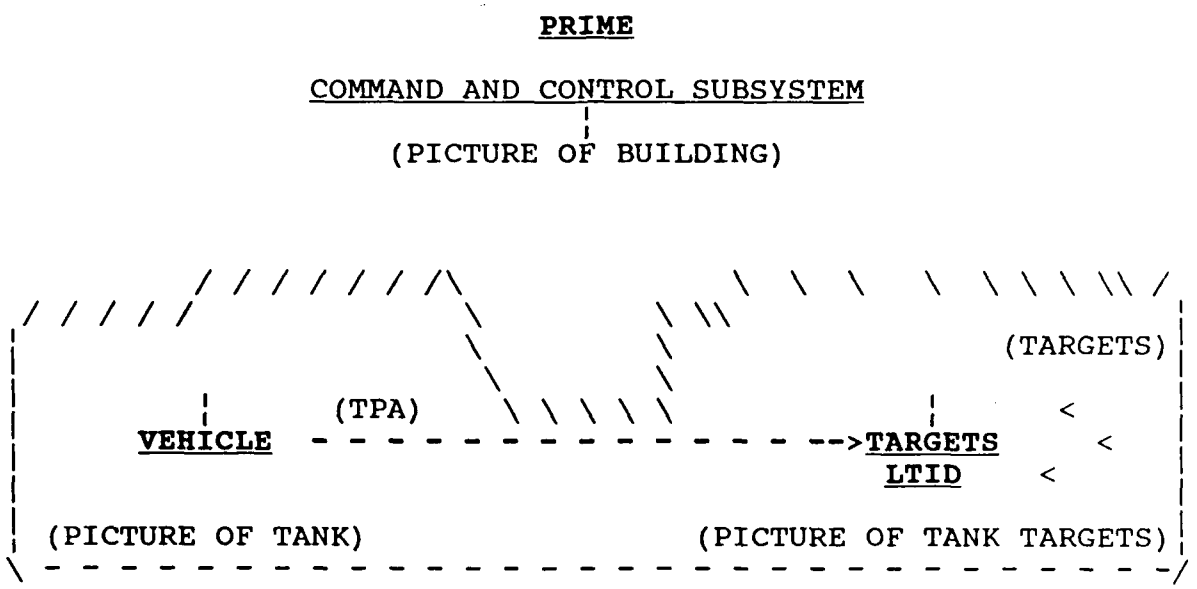
CGI-69


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

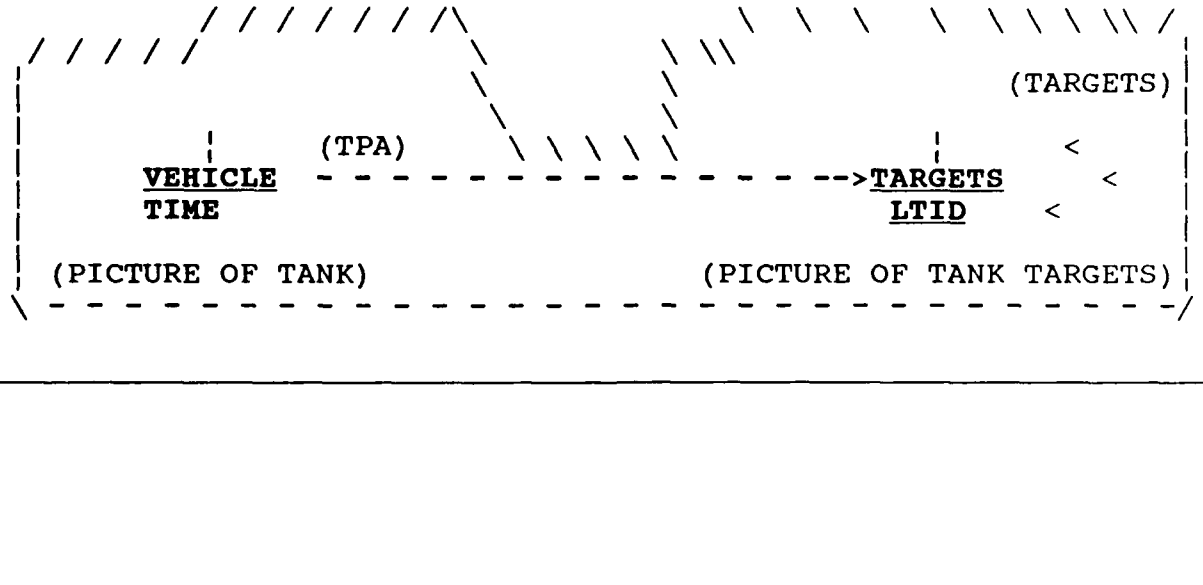
CGI-70


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
ID CODE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

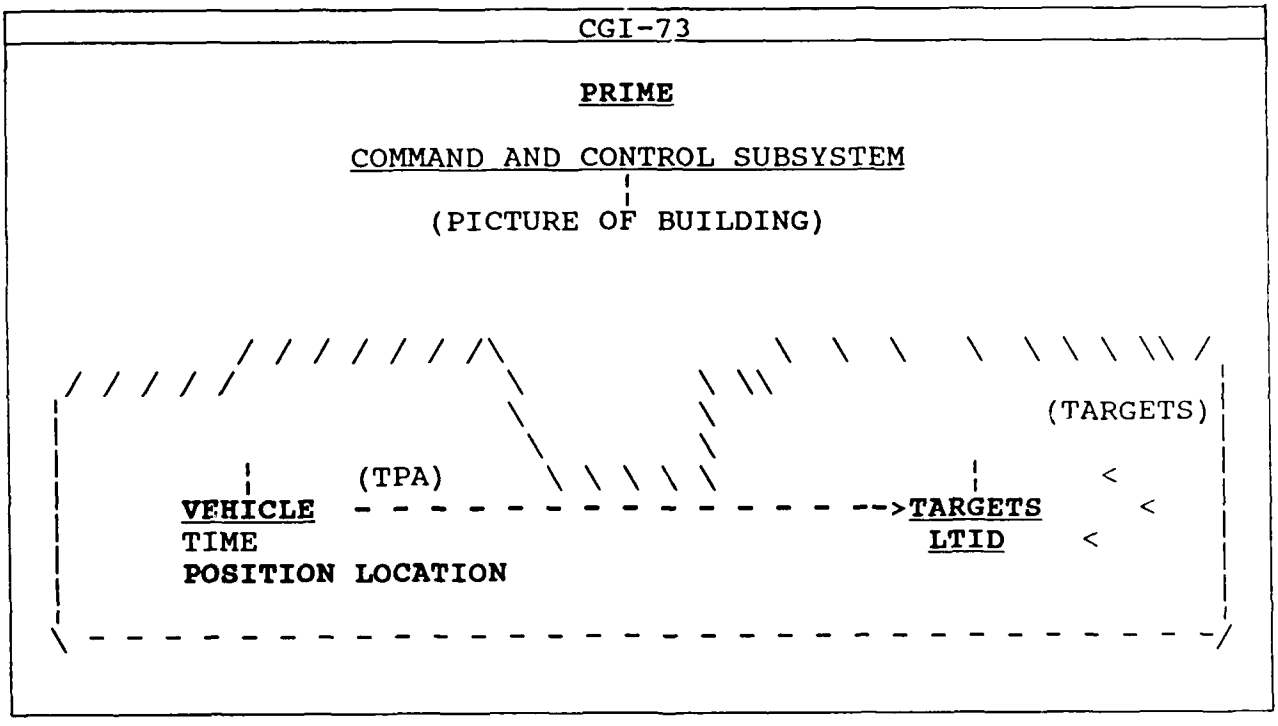
CGI-71


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

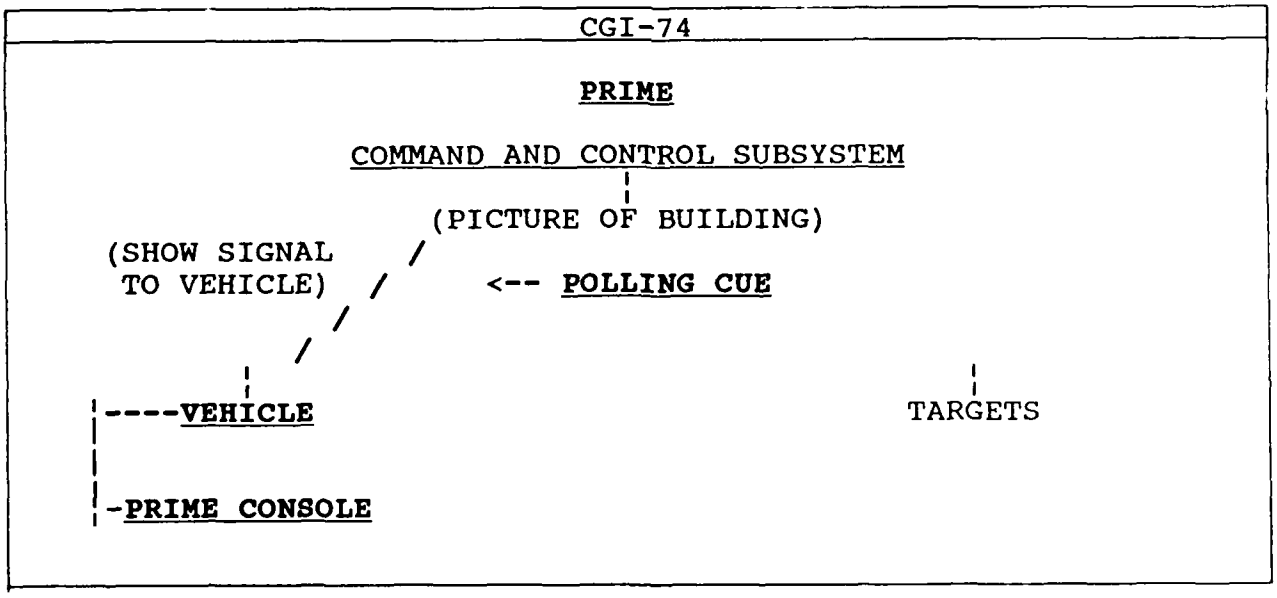
CGI-72


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TIME
TARGETS
LTID
(PICTURE OF TANK)
(PICTURE OF TANK TARGETS)

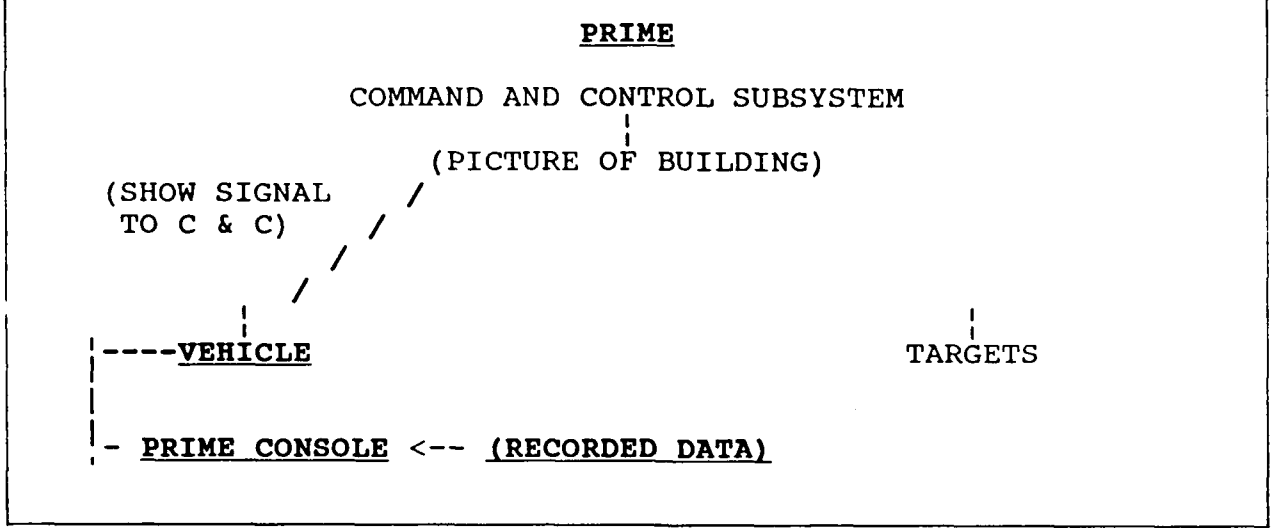
CGI-73


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(TARGETS)
(TPA)
VEHICLE
TIME
POSITION LOCATION
TARGETS
LTID

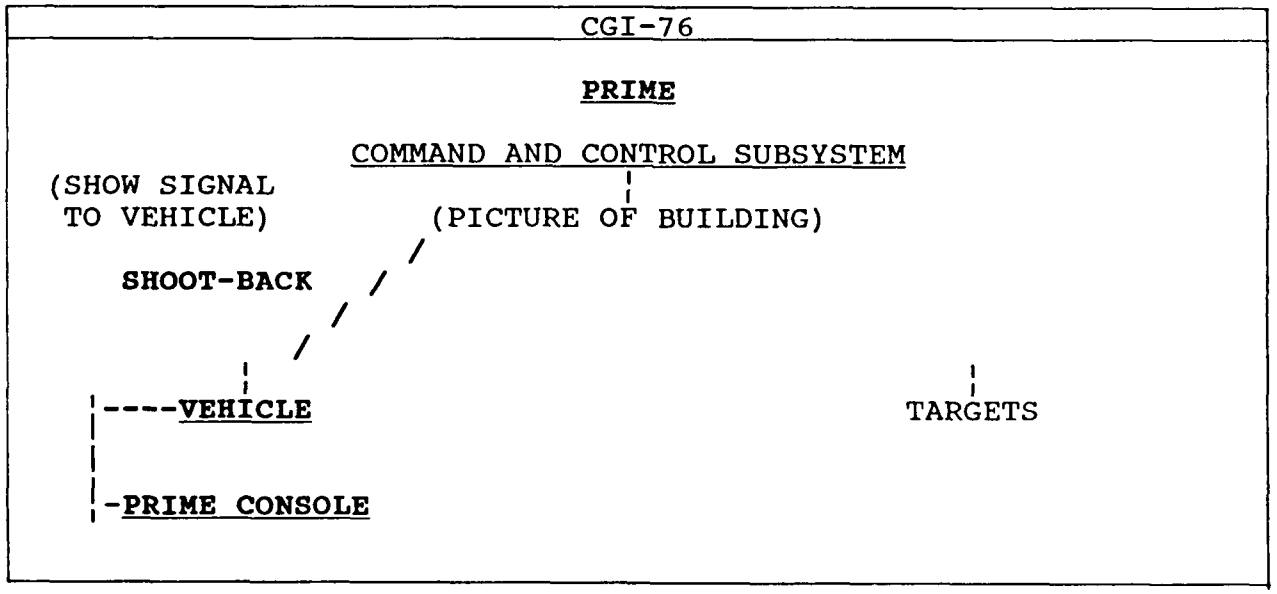
CGI-74


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO VEHICLE)
<-- POLLING CUE
VEHICLE
TARGETS
PRIME CONSOLE

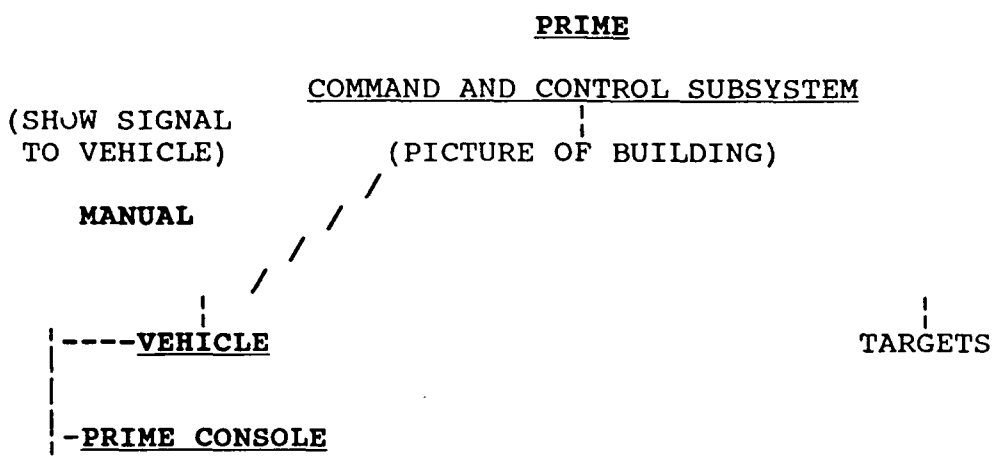
CGI-75


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO C & C)
VEHICLE
TARGETS
PRIME CONSOLE <-- (RECORDED DATA)

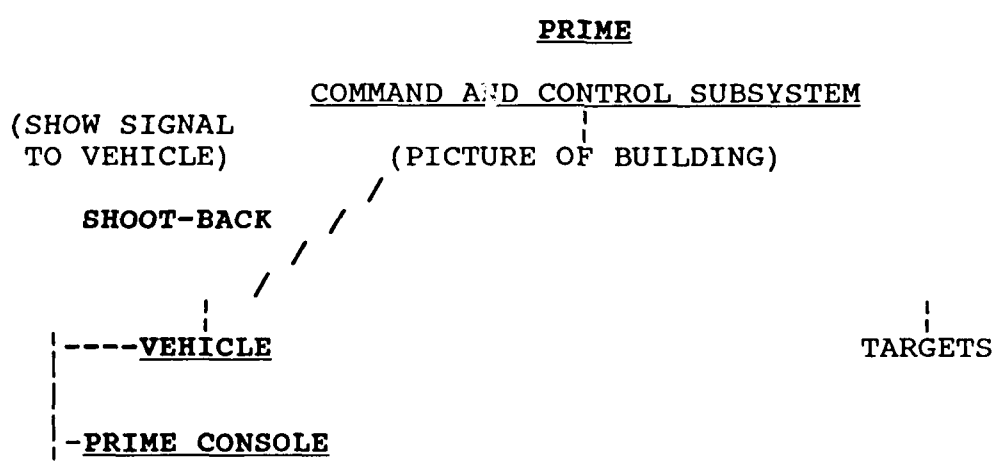
CGI-76


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
SHOOT-BACK
VEHICLE
TARGETS
PRIME CONSOLE

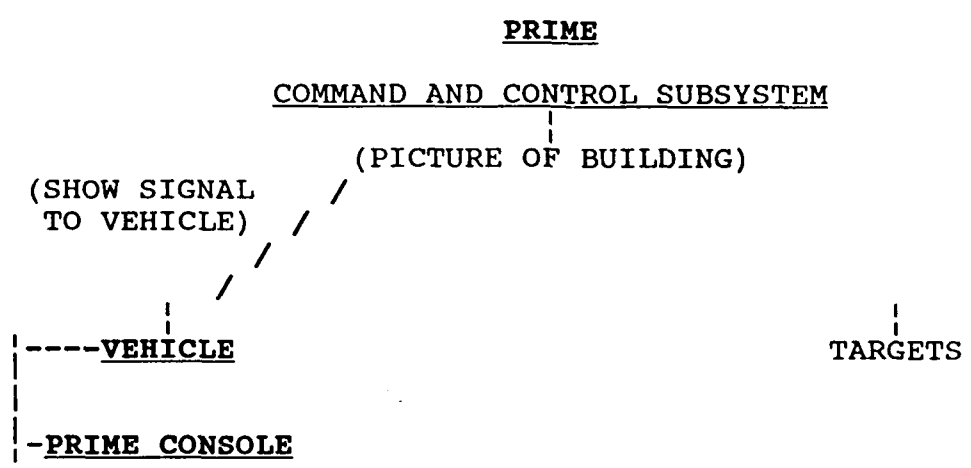
CGI-77


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
MANUAL
VEHICLE
TARGETS
PRIME CONSOLE

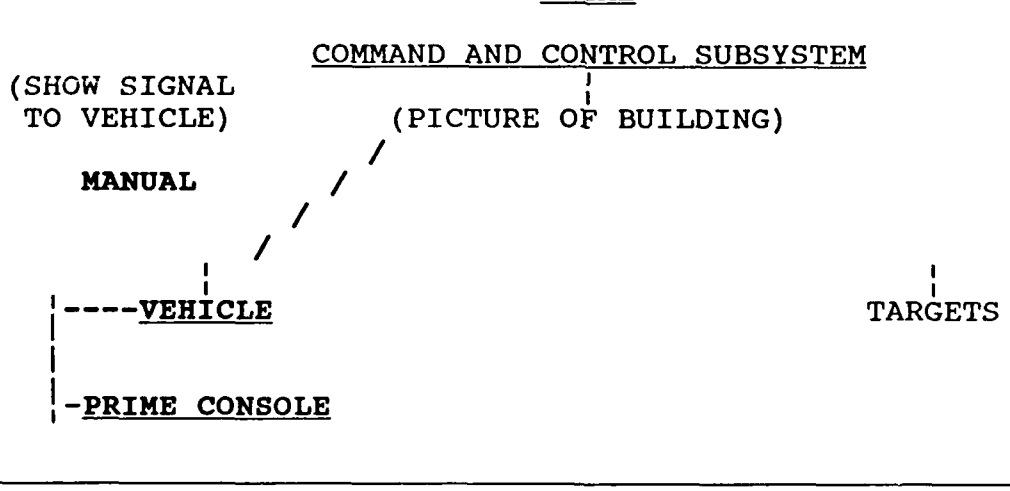
CGI-78


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
SHOOT-BACK
VEHICLE
TARGETS
PRIME CONSOLE

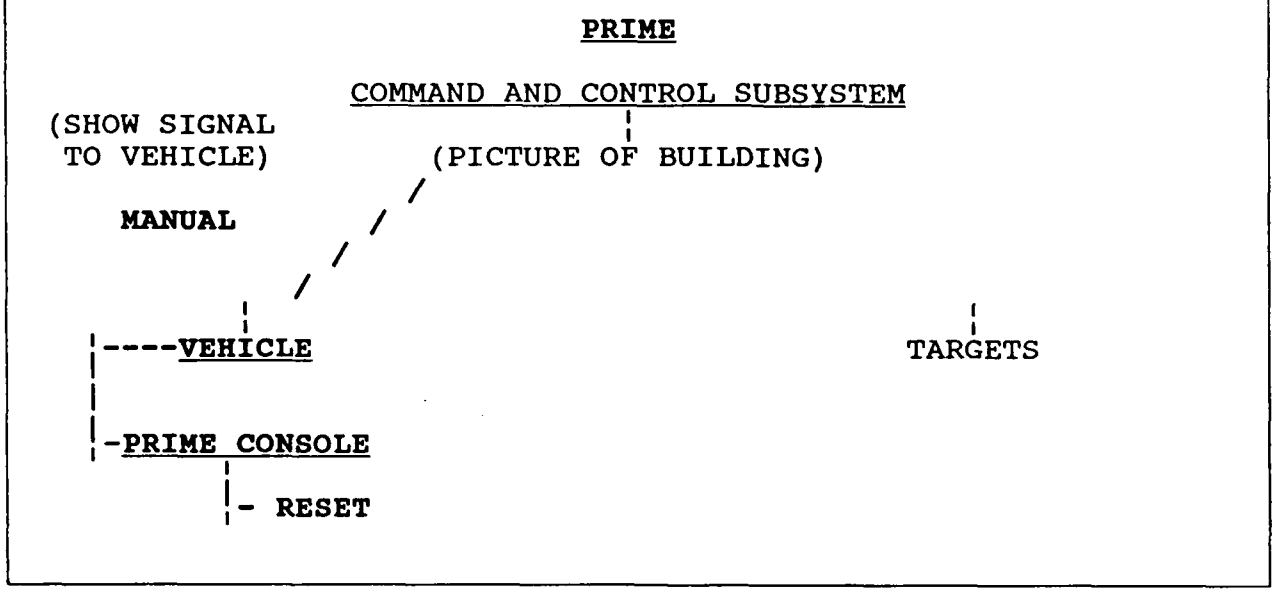
CGI-79


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO VEHICLE)
VEHICLE
TARGETS
PRIME CONSOLE

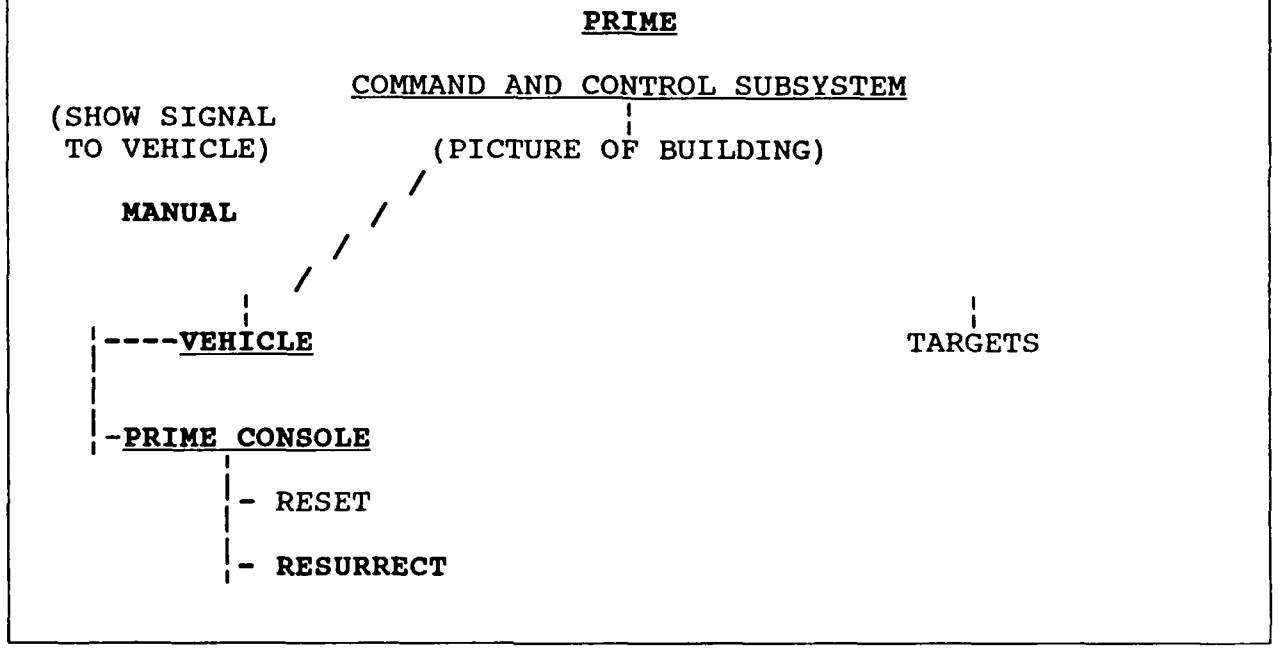
CGI-80


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
MANUAL
VEHICLE
TARGETS
PRIME CONSOLE

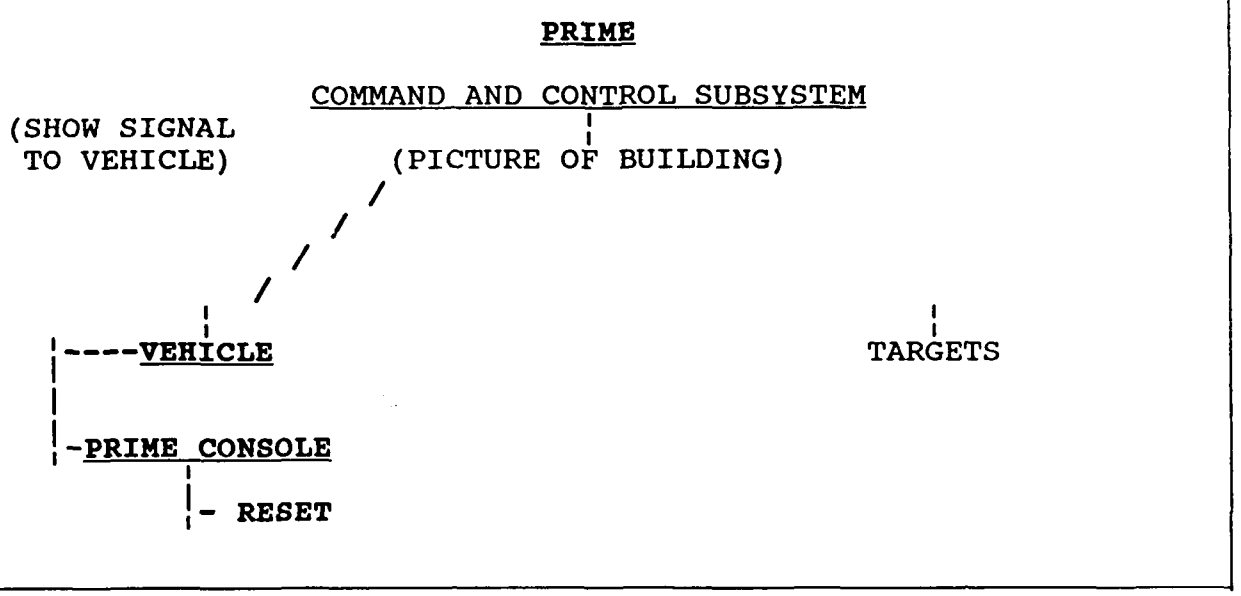
CGI-81


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
MANUAL
VEHICLE
TARGETS
PRIME CONSOLE
- RESET

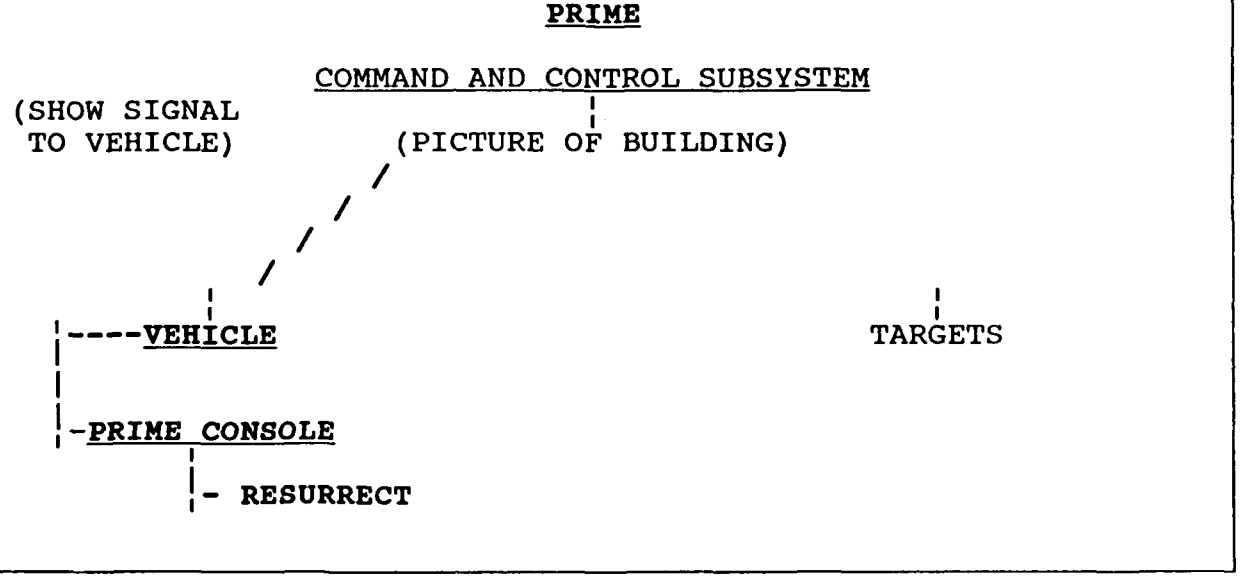
CGI-82


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
MANUAL
VEHICLE
TARGETS
PRIME CONSOLE
- RESET
- RESURRECT

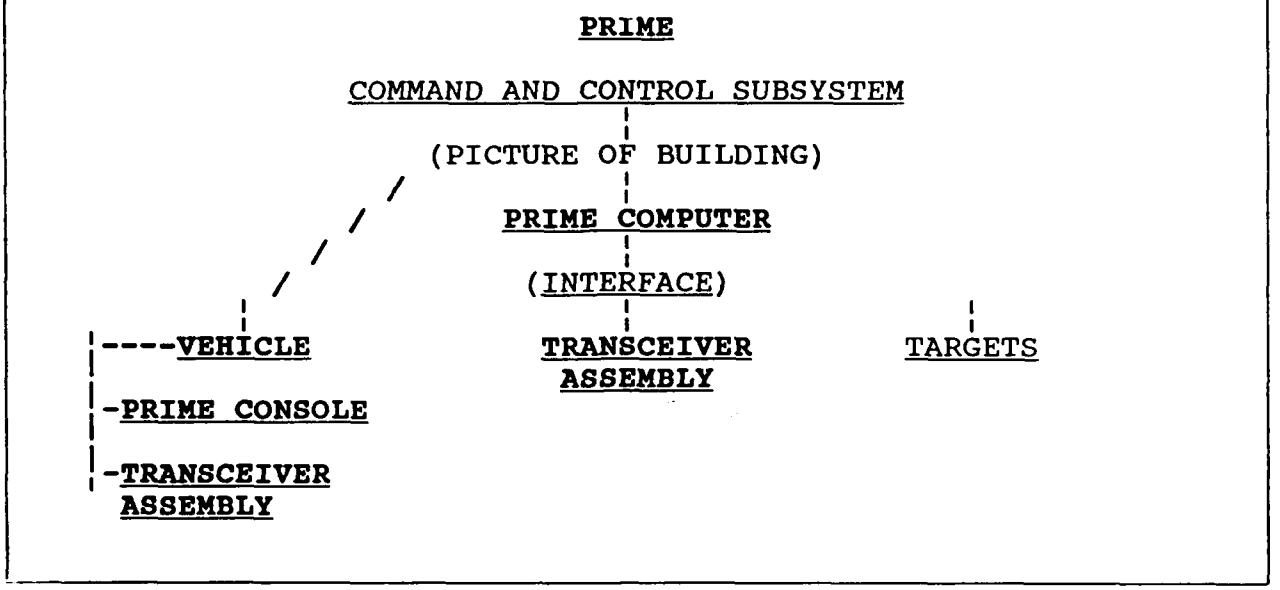
CGI-83


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
VEHICLE
TARGETS
PRIME CONSOLE
- RESET

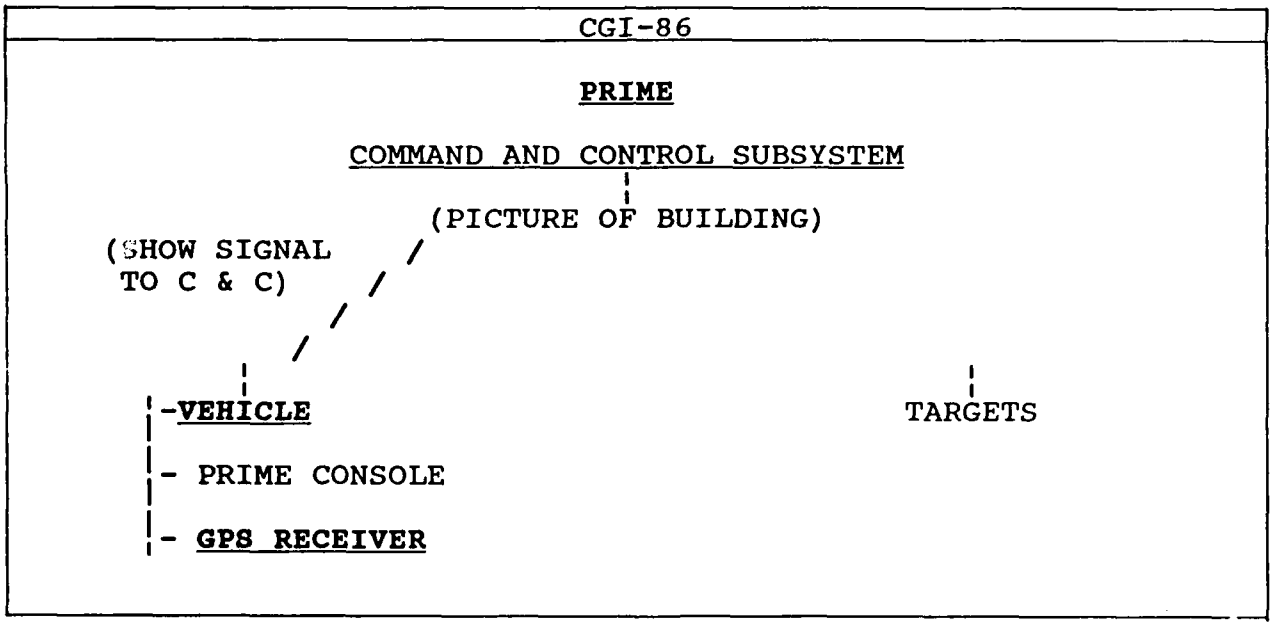
CGI-84


PRIME
COMMAND AND CONTROL SUBSYSTEM
(SHOW SIGNAL TO VEHICLE)
(PICTURE OF BUILDING)
VEHICLE
TARGETS
PRIME CONSOLE
- RESURRECT

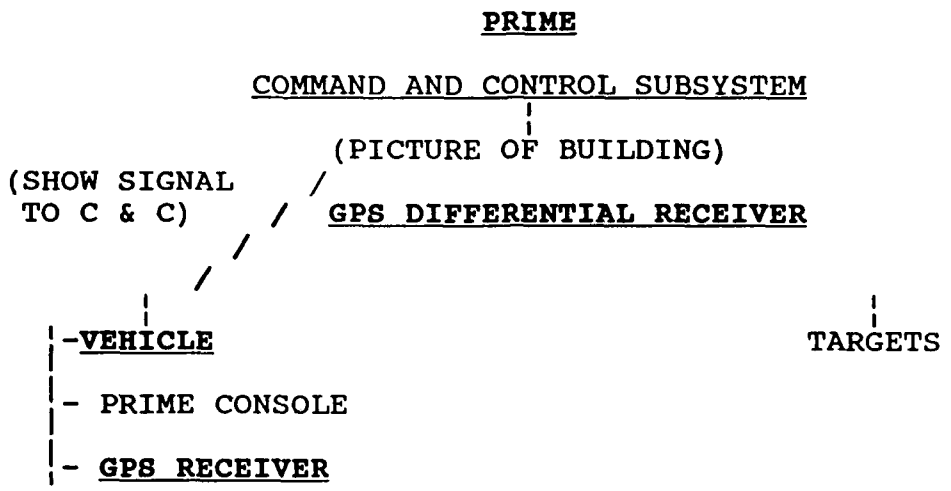
CGI-85


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
PRIME COMPUTER
(INTERFACE)
VEHICLE
TRANSCEIVER ASSEMBLY
TARGETS
-PRIME CONSOLE
-TRANSCEIVER ASSEMBLY

CGI-86


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL TO C & C)
-VEHICLE
TARGETS
- PRIME CONSOLE
- GPS RECEIVER

CGI-87



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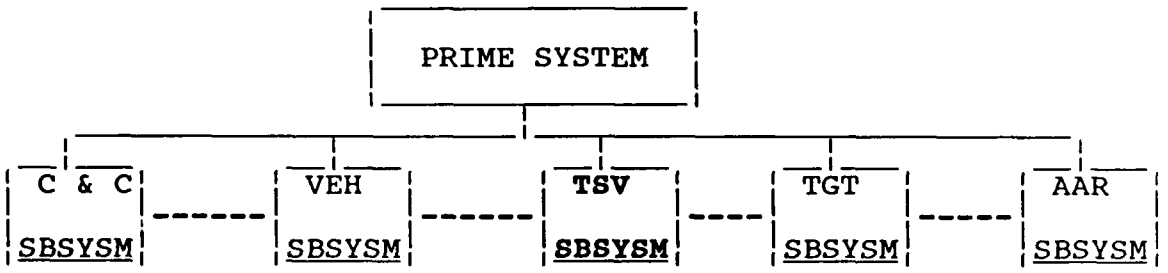
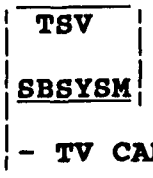


CGI-89

CGI-90



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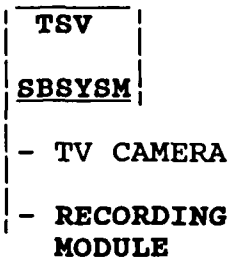

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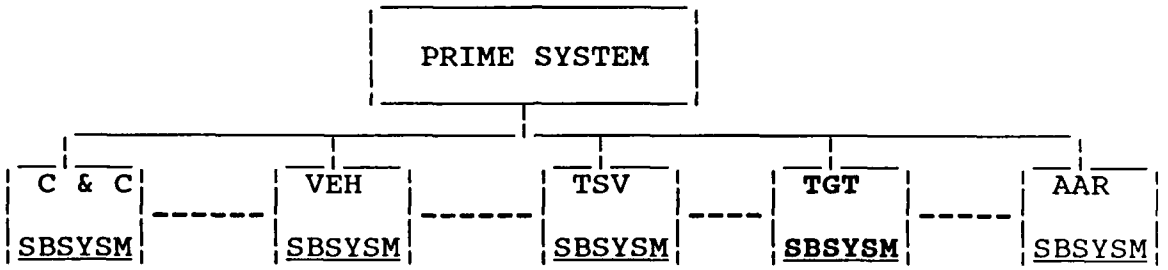

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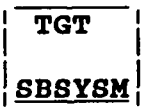

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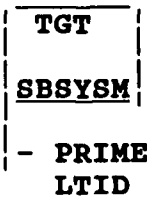

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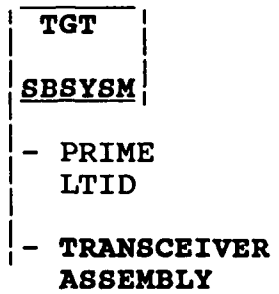

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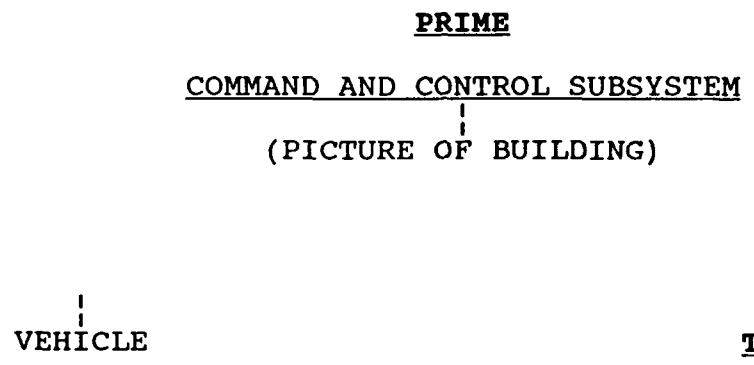

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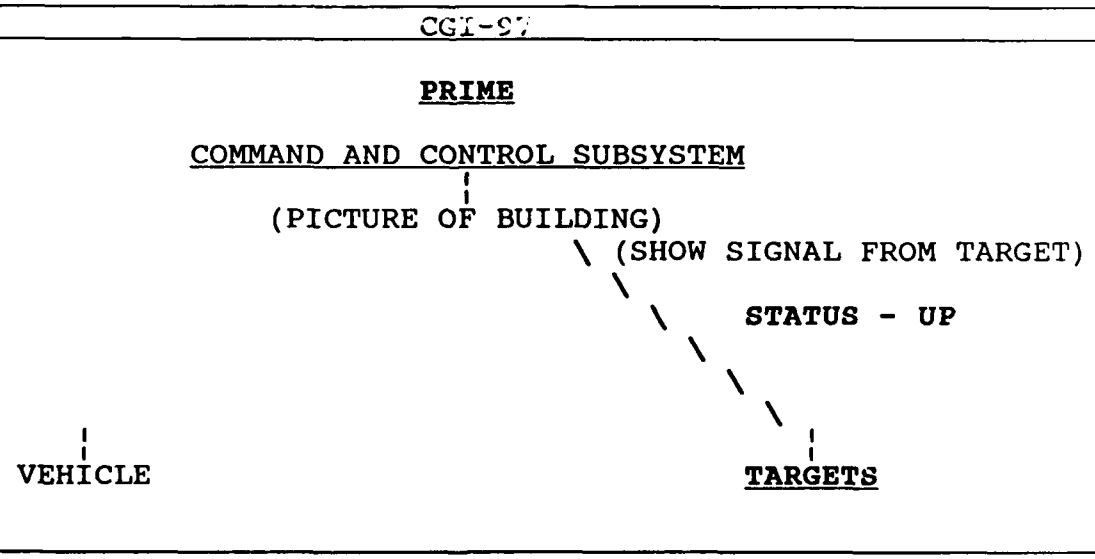

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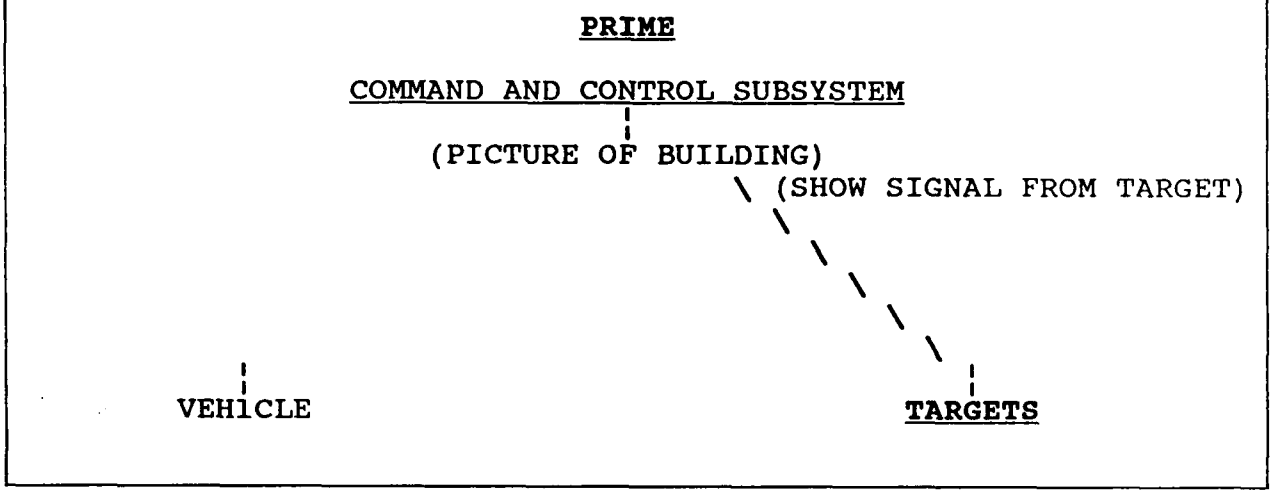
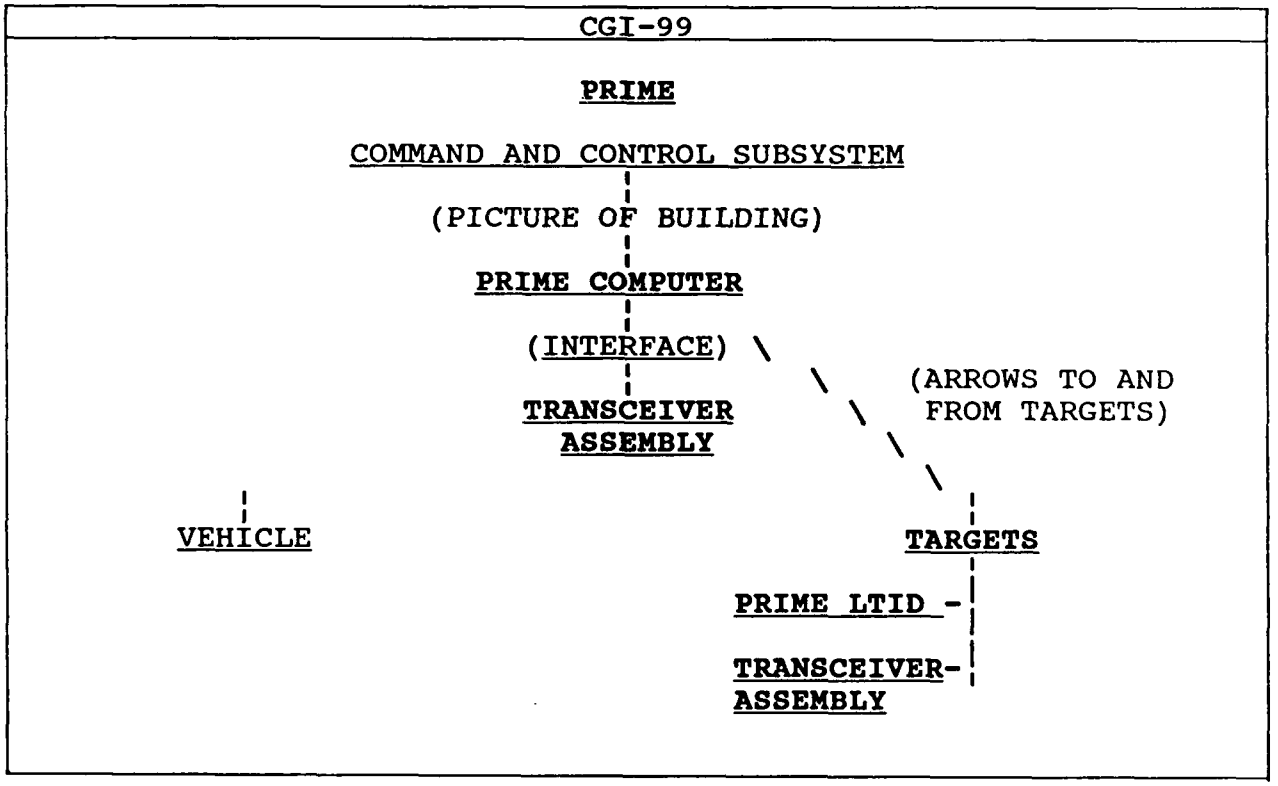
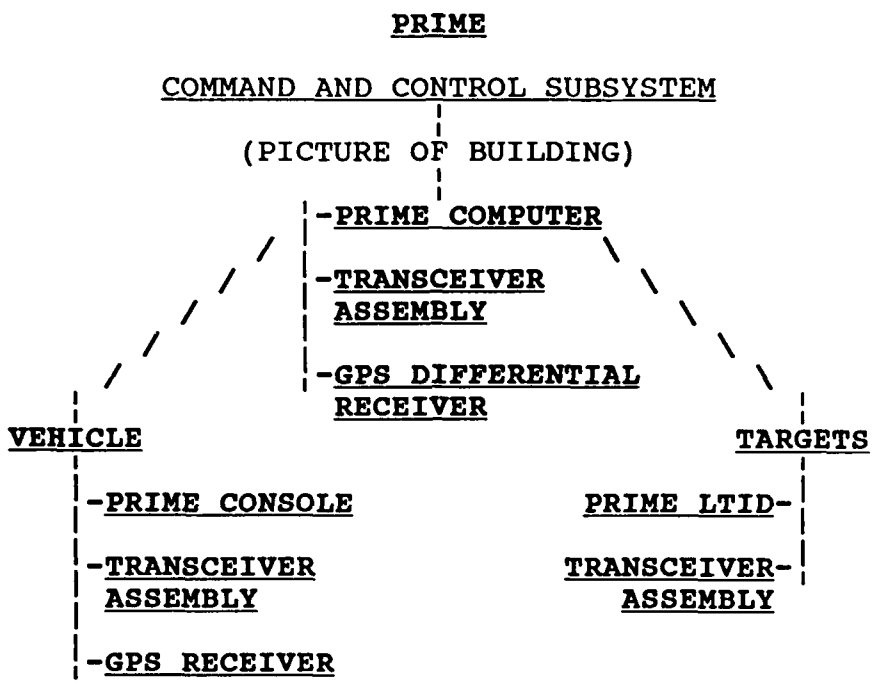

PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
(SHOW SIGNAL FROM TARGET)
VEHICLE
TARGETS

CGI-99


PRIME
COMMAND AND CONTROL SUBSYSTEM
(PICTURE OF BUILDING)
PRIME COMPUTER
(INTERFACE)
TRANSCEIVER ASSEMBLY
(ARROWS TO AND FROM TARGETS)
VEHICLE
TARGETS
PRIME LTID -
TRANSCEIVER-ASSEMBLY

CGI-100



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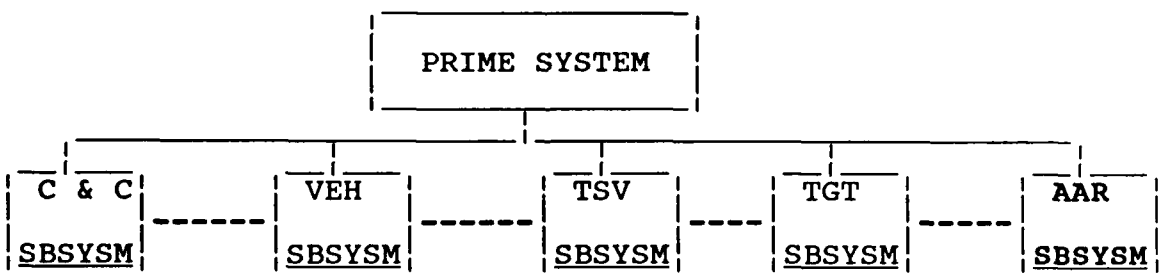
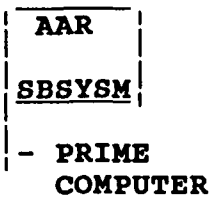


CGI-102

CGI-103



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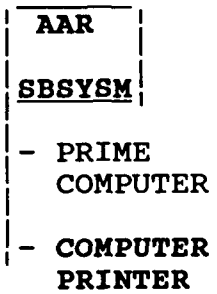

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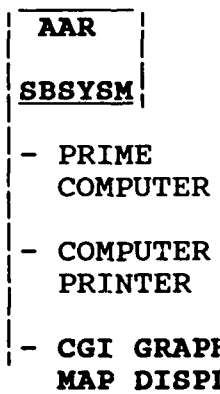
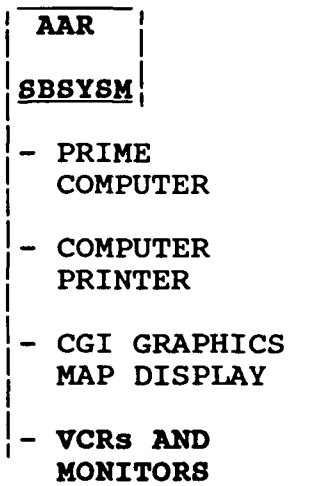
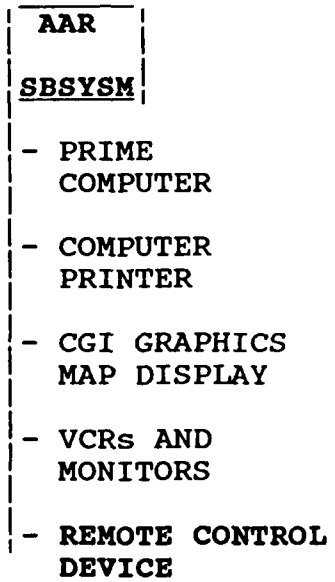


CGI-106



CGI-107



APPENDIX C

Videotape Footage

Videotape Footage

VIDEO- 1: COLUMN OF TANKS APPROACHING CAMERA.

VIDEO- 2: CLOSE-UP OF TARGET COMING UP - FOCUS ON PRIME LTID WITH PRIME LOGO.

VIDEO- 3: TANKS CRESTING A HILL AND APPROACHING THE CAMERA.

VIDEO- 4: PRIME COMPUTER OPERATOR WORKING AT THE COMPUTER.

VIDEO- 5: VISMOD.

VIDEO- 6: TARGET COMING UP.

VIDEO- 7: HOFFMAN DEVICE GOING OFF.

VIDEO- 8: MILES LIGHT ON TANK/BRADLEY FLASHING.

VIDEO- 9: PRIME COMPUTER PRINTOUTS.

VIDEO-10: GRAPHICS MAP DISPLAY WITH TARGET CHANGING FROM DOWN TO UP.

VIDEO-11: GRAPHICS MAP DISPLAY SHOWING TARGET PRESENTATION AREA.

VIDEO-12: PRIME COMPUTER PRINTOUTS.

VIDEO-13: CLOSE-UP OF PRIME COMPUTER PRINTOUTS.

VIDEO-14: GRAPHICS MAP DISPLAY.

VIDEO-15: TSV TAPE.

VIDEO-16: PRIME COMPUTER PRINTOUTS AND STACK OF FOUR VIDEO TAPES.

VIDEO-17: PRIME COMPUTER SCREEN MENU HIGHLIGHT ONE MENU ITEM AT A TIME.

VIDEO-18: COMMANDER AND COMPUTER OPERATOR AT THE PRIME COMPUTER.

VIDEO-19: AERIAL SHOT OF TANKS APPROACHING.

VIDEO-20: PRIME COMPUTER AND OPERATOR AT WORK.

VIDEO-21: GRAPHICS MAP DISPLAY SCREEN.

VIDEO-22: GRAPHICS MAP DISPLAY BEING RESCALED TO A CLOSER VIEW.

VIDEO-23: GRAPHICS MAP DISPLAY BEING RESCALED TO AN EVEN CLOSER VIEW.

VIDEO-24: GRAPHICS MAP DISPLAY CENTERING TO FOCUS ON VEHICLES.

VIDEO-25: VEHICLES MOVING ON GRAPHICS MAP DISPLAY.

VIDEO-26: VEHICLE HITTING A TARGET.

VIDEO-27: VEHICLE NEAR MISSING A TARGET.

VIDEO-28: VEHICLE KILLING A TARGET.

VIDEO-29: TARGET SHOT-BACK AND KILL OF VEHICLE.

VIDEO-29A: COMMAND AND CONTROL TRANSCEIVER ASSEMBLY.

VIDEO-30: GPS RECEIVER.

VIDEO-31: PRIME CONSOLE MOUNTED INSIDE OF TANK.

VIDEO-32: CLOSE-UP OF PRIME CONSOLE.

VIDEO-33: VEHICLE TRANSCEIVER ASSEMBLY MOUNTED INSIDE OF TANK.

VIDEO-34: CLOSE-UP OF THE VEHICLE TRANSCEIVER ASSEMBLY.

VIDEO-35: THE MOUNTED ANTENNA.

VIDEO-36: GPS RECEIVER.

VIDEO-37: SHOT THROUGH THE HATCH LOOKING AT A TSV CAMERA MOUNTED INSIDE A TANK.

VIDEO-38: CLOSE-UP OF THE INSTALLED CAMERA.

VIDEO-39: RECORDING MODULE MOUNTED ON OUTSIDE OF A TANK.

VIDEO-40: INSIDE OF RECORDING MODULE FOCUSING ON THE VCR.

VIDEO-41: TSV POWER SOURCE.

VIDEO-42: TSV TIME/DATE GENERATOR.

VIDEO-43: SEGMENT OF A TSV TAPE.

VIDEO-44: SEGMENT OF A TSV TAPE CONTAINING A FIRE COMMAND AND THE TRIGGER PULL. HIGHLIGHT PORTION OF TAPE THAT SHOWS THE TRIGGER PULL.

VIDEO-45: PRIME AND MILES LTIDS TOGETHER.

VIDEO-46: CLOSE-UP OF THE PRIME LTID CONTROLS.

VIDEO-47: TARGET TRANSCEIVER ASSEMBLY.

VIDEO-48: ATTS.

VIDEO-49: TARGET WITH THERMAL BLANKET.

VIDEO-50: HOFFMAN DEVICE DISCHARGE.

VIDEO-51: AAR BEING CONDUCTED.

VIDEO-52: PRIME COMPUTER.

VIDEO-53: PRIME COMPUTER PRINTOUTS.

VIDEO-54: CLOSE-UP OF UNIT SUMMARY PRIME COMPUTER PRINTOUT.

VIDEO-55: CLOSE-UP OF PLATOON RESULTS ON COMPUTER PRINTOUT.

VIDEO-56: PRINTER WITH COMPUTER OPERATOR TEARING OFF PRINTOUTS.

VIDEO-57: GRAPHICS MAP DISPLAY.

VIDEO-58: TSV TAPE BEING SHOWN ON A MONITOR.

VIDEO-59: WIDE SHOT SHOWING THE AAR BEING CONDUCTED.

VIDEO-60: CLOSE-UP OF INSTRUCTOR GIVING THE AAR.

VIDEO-61: TSV TAPES AND PRIME COMPUTER PRINTOUTS.

VIDEO-62: COLUMN OF TANKS MOVING AWAY FROM THE CAMERA.

GLOSSARY

AAR	after-action review
ARI	Army Research Institute for the Behavioral and Social Sciences
ARTEP	Army Training and Evaluation Program
ATTS	Automatic Tank Target System
AT-21	Army Training 21
BFV	Bradley Fighting Vehicle
BLK MOD	block modification
C&C	command and control
CAC	Combined Arms Center
CATA	Combined Arms Training Activity
CG	Commanding General
CGI	Computer Generated Imagery
CINC	Commander in Chief
CTC	Combat Training Center
CTDR	commercial training device requirement
DOD	Department of Defense
DOTD	Directorate of Training and Doctrine
ECP	engineering change proposal
FM	Field Manual
FRG	Federal Republic of Germany
FTX	field training exercise
FY	fiscal year
GPS	Global Positioning System
GPSE	Gunner Primary Sight Extension
G-3	Assistant Chief of Staff for Operations and Plans
I-MILES	Improved Multiple Integrated Laser Engagement System (MILES)
ITS	Integrated Training Strategy
LTID	Laser Target Interface Device
METL	Mission Essential Task List
MILES	Multiple Integrated Laser Engagement System
MTP	Mission Training Plan
OPTEMPO	Operating Tempo
PAM	Pamphlet
PM TRADE	Project Manager for Training Devices
PRIME	Precision Range Integrated Maneuver Exercise
P3I	preplanned product improvement item
RCC	range control computer

SIMNET	Simulation Networking
STX	Situational Training Exercise
TADDS	Training Aids, Devices, Simulators, and Simulations
TCATC	TEXCOM Combined Arms Test Center
TPA	target presentation area
TRADOC	Training and Doctrine Command
TSV	Thru-sight Video
USAIS	U.S. Army Infantry School
USATSC	U.S. Army Training Support Center
USAARMS	U.S. Army Armor School
USAREUR	U.S. Army Europe
VCR	video cassette recorder
3ID	Third Infantry Division